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## Truth or Consequences

ONE essential part of the democratic tradition of eternal vigilance is that the body politic should submit to a certain amount of Congressional prying and probing. There is inevitable untidiness about the rule "of, by and for the people" that could get somewhat out of hand if it were not for occasional inquisitorial policing backed up by a Victorian heritage of individual moral responsibility.

History shows a long line of special Congressional investigating committees charged with exploring specific troubled waters. Some committees have functioned with intensity of purpose and consummate skill and thereby have contributed to the vigor of representative government. Others appear ever to flounder in a morass of sublimated infantilism or Machiavellian dissimulation. Committees of the latter type seem to have predominated within recent years, so much so that there is a distressing tendency by both committee and public to view the investigations either as entertaining hot-foots of hopeless unfortunates or sound-ing boards for irresponsible fanatics, or some *tour de force* of a poli-tician on-the-make.

As in some summer stock theater, the recent performance of the Senate War Investigating Subcommittee have just about gotten out of hand. The entire cast is busily upstaging each other while reading from personally edited scripts. This may serve to distract attention from disturbing developments abroad and appeal to the sensibilities of a heat-weary populace, but it hardly enhances the reputation of Congress or furthers the purpose for which the subcommittee was activated.

At very best, any inquiry into individual or company performances during the war requires tolerance, elementary prudence and understand-ing, a fair amount of courtesy and good temper and a certain degree of willingness to listen carefully and long to the other man. It is all too easy (and so very human) to slide off into muckraking, preaching or spurious lamentation.

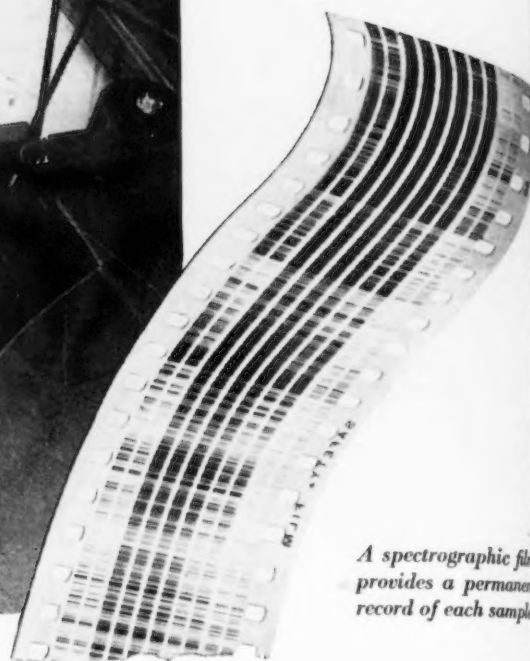
No committee searching for the truth should fail to readjust its thinking back to the period four or five years ago. Mr. Kaiser's flying boats look silly now, but in the grim and frightening days millions of people, much of the press (but not THE IRON AGE) and many Congressmen were solidly behind the flying box cars. There were un-economical and undesirable steel facilities built just to silence regional and Congressional pressures. Nor was the clamor for sponge-iron plants easy to face! There were a hundred-and-one mistakes, selfish pressures and popular demands based on ignorance. The atom bomb would have been the colossal \$2 billion blunder of all time if it had failed at Ala-mogordo. It would have been the country's tragedy if the Axis had developed it first. In general the country's war effort was a superlative unselfish cooperative effort on the part of labor, management and mili-tary. It should swell the breast with pride. It was only incidental that Washington was a glittering welter of parties during the war and there is a certain naivete about the surprise of Congressmen that girlies and expense accounts were involved.

In searching for fact and truth when the subcommittee reconvenes it should establish new and healthy precedents by permitting cross-examination of witnesses, ruling out hearsay and employing all the other Anglo-Saxon court practices which safeguard the principles of justice, equity and equality. To be sure, Congressional committees are investigating bodies, not trial courts, but the limelight of publicity beats so intensely these days that irresponsible testimony can blast individual reputations and en-danger personal security fully as much as a criminal trial. The struggle between truth and falsehood is a confusing affair under the arbitrary and despotic powers wielded by Congressional committees. With so much of the world retrogressing to the tyranny of political police and *lettres de cachet*, Congressional representatives would do well to abandon a procedure that smacks of the star chamber.

*T. W. Lippert*



*Examination of the spectrum emanating from the vaporization of the steel sample in an electric arc quickly reveals the chemical content of the sample.*



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## **Spectrographic Analysis ... another Inland Routine**

To check the chemical composition of the heat in the open hearth furnace as it nears the end period, samples taken from the furnace are carried by pneumatic tube to the Inland laboratories for a quick but accurate spectrographic analysis. If the metallic composition of the heat is not exactly right, this check will determine the changes necessary to bring the steel to specifications. This is only one of the many tests made with this new and useful analytic tool—tests that make possible Inland steels of uniform quality to meet your service requirements.

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► Elliott Co., Jeannette, Pa., has built a pilot oxygen producing plant and is about ready to give it a trial run. The company has been working on oxygen producing equipment for 2 years but the pilot plant has been delayed by slow deliveries. Production—on a pilot plant basis—of low purity oxygen will begin within the next few weeks. Engineering results on the project are reported to be extremely favorable to date.

► A new type thermostatically controlled fan is expected to appear on several 1948 model cars. When the engine runs cool the fan cuts out, eliminating fan drag on the engine.

► Some top officials in stainless steel manufacturing anticipate a price increase by Sept. 1 but others feel the relative weakness of the market will not support higher prices.

► Experimental work on the use of lithium and lithium compounds for reducing sulfur in steel shows signs of promise. In the furnace bath lithium compounds drastically reduce the sulfur content of both the bath and the slag. Lithium is also being used as a ladle addition.

► It is almost certain that one of the independents will bring out an automobile so new that according to some sources only the tires of the old model remain. The new car is expected before the end of the year.

► American aircraft manufacturers are doing well on Swedish business. The Saab-Scandia, a medium sized commercial aircraft to be built there will be powered by specially designed Pratt & Whitney engines and will have an American designed pressurized cabin. Speed will be 250 mph and first deliveries are expected in 1949.

► Washington observers are predicting that Congress will find ways to spend most of the money "saved" by appropriations cuts during its recent session. If taxes had been cut, they say, the money wouldn't have been there to spend.

► Power plant producers have the biggest backlog of orders of any British industry. Some of the larger firms have orders for 10 years' work on hand.

► Stampers assert that the intermittent flow of sheet and strip to their plants has increased die setup charges in some shops. It is said that few of them have been fortunate enough to operate any single press for a full 8-hr run.

► It is predicted that woven plastic will replace canvas for convertible car tops. Tops for the Packard convertible contain a substantial percentage of rayon and Chrysler is reported ready to adopt a woven plastic top.

► Completion of a 300-ft tower, which used 800 tons of fabricated steel, at Federal Telecommunications Laboratories, Nutley, N. J., will soon mean the start of experiments to permit a single radio station to simultaneously transmit dozens of programs on a single channel.

► Costs on Metropolitan Life's 12,000-family apartment housing project in New York City have jumped from an original estimate of \$55 million to \$110 million. New estimates are being prepared weekly to keep up with steadily rocketing costs.

► Production is now under way on a new window shade that is cut and formed from a solid metal sheet. Horizontal, angled slots, 18 to the inch, let in light and air but keep out insects and the sun's rays.

► Ferroalloy producers, though committed to a firm price policy on contracts until the end of the third quarter are studying their price schedules on all products in the light of increasing costs. In October, price increases may be applied to alloys of chromium, silicon, manganese, vanadium, titanium and perhaps others.

► Stocks of coal held by or for the British iron and steel industry are even lower now than they were at this time last year. The figure now is 384,000 tons, or 1.7 weeks' supply against 432,000 tons at this time last year. The industry recently got an additional allocation of 42,000 tons weekly.

► The latest food ration cut in England affects canned goods, breakfast cereals, dried fruit, and cookies, dropping from 32 to 28 points a month. This will get the Briton a can of salmon each month, or a can of Spam with four points left over.



# Silicon Carbide Radiant Tubes

**I**T has always been a problem to hold maintenance costs down on continuous furnaces operating at 2000°F and over. Radiant tubes and conveyer rolls which were made of high temperature heat resisting alloys were not too satisfactory for economical operation. This was one of the principal reasons for installing a gas-fired, continuous roller hearth furnace for high temperature annealing constructed by the Gas Machinery Co., Cleveland, which had silicon carbide, Carbofrax\*, radiant tubes and conveyer rolls. Further, a furnace was required to anneal welded stainless tubing only, varying in size from  $\frac{3}{4}$  in. OD having a wall thickness of 0.020 to 0.035 in. to 3 in. tubing with a wall thickness of 0.085 to 0.125 in. This being a continuous furnace, length of tubing is unlimited; however, normal range under which this unit operates varies from 10 to 25 ft.

The furnace casing consists of heavy, all-

welded structural steel plate tied together by means of heavy structural members to form a rigid frame. The sides and end walls are lined with 9 in. of 2600°F insulating firebrick backed by 4 in. of plastic insulation. The bottom lining consists of 7½ in. of 2600°F insulating firebrick backed by 5 in. of 1600°F insulating brick.

The furnace is provided with two manually operated counterweighted doors. Doors are of welded construction and water cooled, and are lined with 4½ in. of 2600°F insulated firebrick.

One of the notable features of this furnace is the use of silicon carbide radiant tubes. Silicon carbide has long been established as a high temperature refractory; however, its use as a radiant tube has not been fully developed until recently. It has always been a problem to make a gas-tight joint that would be effective under the wide range of operating temperatures.

The four 6-in. ID radiant tubes used are each 15 ft long; two are mounted below the conveyer

\* Carbofrax is a registered trademark of the Carborundum Co.

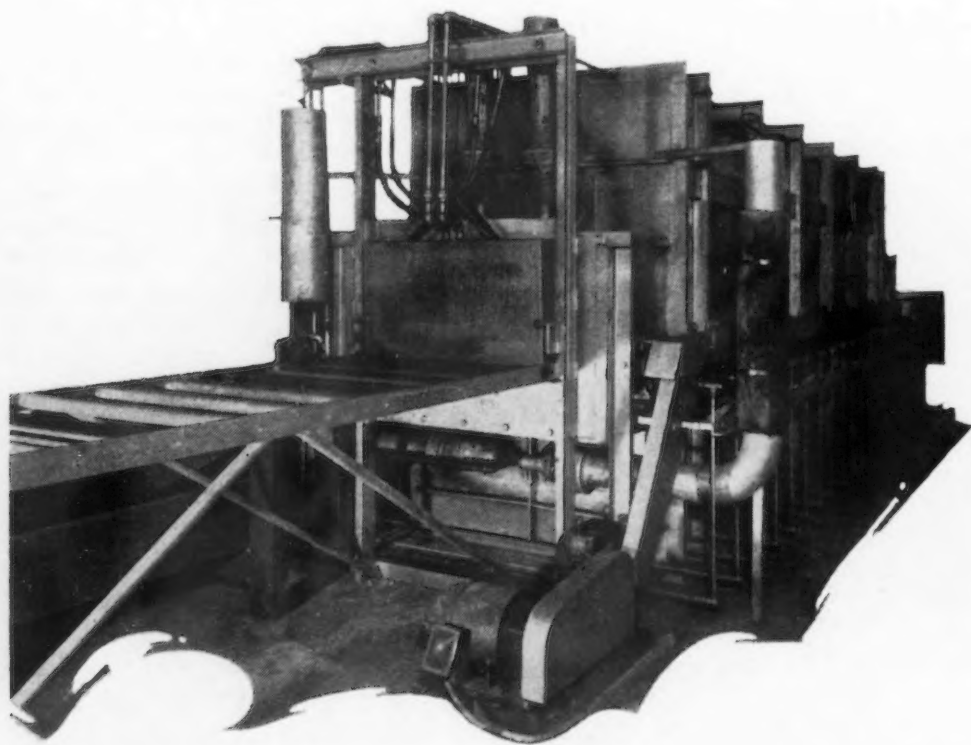


FIG. 1 — Refractory radiant tube, refractory roller hearth annealing furnace. Photo courtesy Gas Machinery Co.

# for Annealing Furnaces

rolls while the other two are hung from the furnace roof. The radiant tubes are made up in sections and joined by means of mating ball and socket surfaces which are ground to a gas-tight fit. To maintain mating surfaces in contact and to take care of any changes in length in the jointed tube, due to either expansion of the tube or to shortening of the tube (resulting in angular movements of the sections), one end section is anchored against longitudinal movement. The other end section floats against a spring which effects a longitudinal compression loading.

The several sections of the horizontal tube are supported in cradle shaped hangers mounted in the furnace wall, see fig. 1. The cradle of each support is deep enough to prevent the sections from buckling in a horizontal plane under the compression loading, the weight of the tubes being sufficient to prevent buckling in a vertical plane.

With the gas-tight silicon carbide radiant tubes it is possible, without any major furnace changes, to anneal with a controlled atmosphere.

The furnace is fired by means of four radiant tube burners, mounted on 15-in. centers on the material-feeding end of the furnace.

On the discharge end of the 6-in. ID silicon carbide radiant tubes, cast alloy eductors are mounted for two specific purposes:

(1) Subatmospheric pressures can be maintained so that if any leaks occur in the radiant tube these leaks would be inward to the tube and not into the furnace. This eliminates any possibility of contaminating the furnace atmosphere, particularly on controlled atmosphere installations.

(2) Flame length can also be controlled to

**Departing from the conventional use of alloy materials in heat-treating furnaces, the Globe Steel Tubes Co. recently installed a high temperature annealing furnace with silicon carbide radiant tubes and conveyer rolls. Various construction features of this continuous, controlled atmosphere, tube-annealing unit are described, and an interesting technique for predetermining furnace speed is presented herein.**

o o o

By M. H. LUTTROPP  
Industrial Engineering Dept.  
Globe Steel Tubes Co., Milwaukee

o o o

give even heating the entire length of the tube plus high fuel efficiency.

A direct connected centrifugal blower supplies the air to the eductors at controlled volumes to permit the most economical fuel operating conditions.

Deviating from the conventional heavy alloy roller hearth, a water-cooled sectional silicon carbide roll is being used. The furnace hearth is 2 ft 6 in. wide and 15 ft long. Including the inlet and outlet sections of the furnace proper, which is not exposed to the radiant tubes, there

are 21 rolls, 6 in. in diam, mounted on 12 in. centers. Briefly, the design of these rollers consists of hollow water-cooled shaft on which are mounted concentrically the sectional silicon carbide rolls. The annular space between the tube rollers and steel shaft is cast with a refractory insulating concrete of special composition to provide the maximum strength at operating temperatures. For this particular furnace the rolls are designed to carry full hearth loading at 2000° F without any "crankshafting." This is another outstanding feature, since when using alloy rolls, the hearth loading must be reduced as the higher operating temperatures are approached. Due to the fact that the rolls are water cooled, full strength is retained regardless of temperature operation of the furnace and the rollers need not be oscillated to prevent sagging. As a matter of fact, the rolls can be stopped entirely to permit a soaking period if the operation so requires.

In spite of the fact that the conveyer rolls are water cooled, it has been found that there is very little temperature differential between the rolls and furnace atmosphere. This unusual feature is attributed to the high insulating qualities of the insulating concrete between the tube

rollers and the supporting water-cooled steel shaft.

Each steel shaft is water cooled and fitted with a stuffing box on each end to allow for connections to the supply and outlet piping. Water supply is obtained from the plant cooling water supply lines and returned to the system as a makeup water supply. Approximately 15 gpm of cooling water is required to cool all the conveyer rolls and furnace doors at a water temperature rise of 20°F.

To maintain a full supply of water to the steel shaft on the conveyer rolls, an inverted seal is provided on the shaft outlet which discharges to a common water trough located on the opposite side of the furnace water supply.

The furnace conveyer rolls are supported by self-aligning roller bearing pillow blocks designed to permit a considerable amount of misalignment in the roller trunnions without binding.

In order to remove a roll from the furnace chamber, a special roller tile is set on the drive side. By the removal of a cover plate this tile, which is not cemented in place, may be removed and the roll is slipped out through the side of the furnace.

The drive ends of all the furnace rollers are interconnected by a roller chain which in turn

is driven by a variable speed motor and speed reducer. Work traveling speed through the furnace, ranging from 0.4 to 4 fpm, easily handles all necessary speeds for material being run.

For temperature control a Leeds & Northrup strip chart recorder is provided with a necessary relay to operate the air and gas proportioning valve drive mechanism. A closed end Rayotube is used as a temperature detecting instrument. Conveyer roll speed is controlled by a Reliance Electronic speed control unit.

### Furnace Hearth Loading

The capacity of the hearth does not necessarily follow a definite formula. Tube diameters and wall sizes determine weight to be loaded on hearth and also conveyer roll speed.

As a guide for the furnace operator, a loading chart, fig. 2, is referred to. This chart is set up so that the operator can predetermine conveyer speeds after selecting the number of pieces loaded across the hearth and knowing tube weight per foot. The dotted lines on the chart illustrate the solution of a typical operating problem. For example, assuming a desired output of 1000 lb per hr of tubing with a weight per foot of 1.343 lb, eight pieces to be run through in parallel, what should the conveyer speed be set at? To solve this problem, the oper-

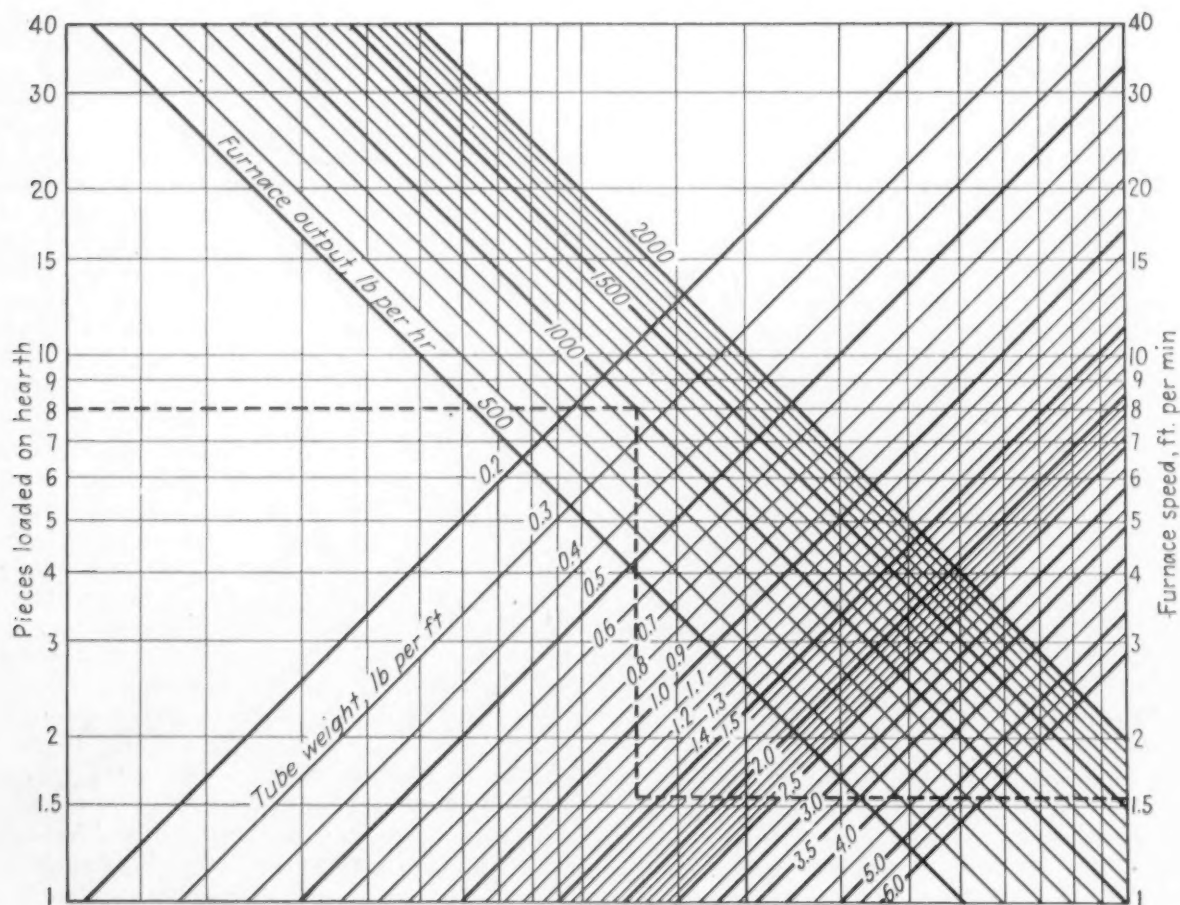
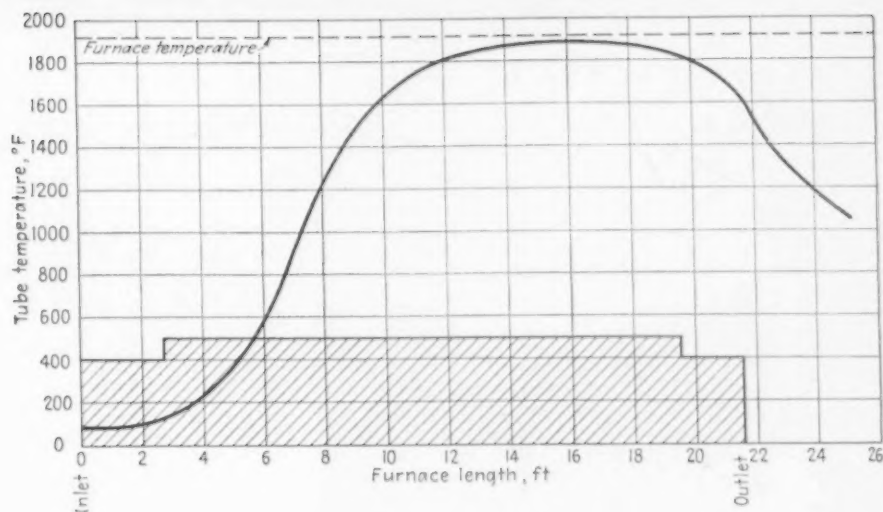


FIG. 2 — Continuous furnace loading chart for predetermining conveyer speed. Dotted lines denote sample calculation. (See text)



FIG. 3 — Temperature of type 304 tubing as it passes through furnace at the rate of 1.85 fpm, or 1490 lb per hr. Furnace temperature (Rayotube reading) is 1920°F. Rayotube location is at 16 ft.



ator enters the chart at the left-hand ordinate (eight pieces), moves across to the right to the 1000 lb per hr diagonal line, then vertically to the 1.343 lb per ft diagonal line, and then to the right to arrive at the desired speed of 1.55 fpm.

Production records indicate that average hourly capacity for an 8-hr period ranges from 950 to 1100 lbs. Due to the distortion of tubing when being brought up to temperature, clearance had to be provided to prevent tubing from jamming and rubbing on the furnace sidewalls. It is therefore not practical to fully load across the entire width of hearth.

The furnace loading equipment consists of a free rolling roller type conveyor on inlet and outlet ends of furnace.

Since all work run in this furnace is light wall, welded stainless tubing, no water quenching is necessary. The surrounding shop atmosphere provides sufficient cooling to bring the heat down fast enough to attain the required physicals.

Table I gives a comparison of performance between the Gas Machinery Co. silicon carbide radiant tube furnace and the batch type furnace which has been replaced. The data in this table indicate that the Gas Machinery unit surpasses the batch type furnace in all respects. Labor costs alone have been cut in half by the installation of the roll conveyor type furnace feed, in addition to the other desirable feature of a continuous through-feed roller hearth. Fuel costs have been reduced through improved construction and temperature control. There has been a definite improvement on quality. Previously the burned gases were admitted into the heating chamber, thus producing various scale types and effecting the analysis and pickling proper-

ties of the steel. Uniform heat treatment is now assured through the entire length of tubing. All the stainless tubing annealed in this furnace is of the 18-8 type, with about 90 pct being type 304 and the balance being the other 300 series.

#### Furnace Temperature v. Tube Temperature

In spite of the accuracy of the temperature indicating devices there is no direct method of determining actual tube temperature at the various points in the furnace. An experiment was therefore made to determine tube temperature in relation to pyrometer temperature. With a hearth loading at the rate of 1490 lb per hr, it was found that at the point of location of the Rayotube a temperature difference of 30° existed between furnace and tube temperatures.

Fig. 3 indicates the temperature rise and drop at the various points of the furnace.

This temperature difference between the furnace and the work can be controlled by either changing the conveyor speed or the hearth load.

Production and fuel consumption for this unit has now reached a point where this furnace compares very favorably with other annealing units. Tests have been made at various operating periods which revealed furnace operating efficiencies around 22 pct. Using 3200 Btu butane gas and operating at a furnace temperature of 2000° F, an Orsat analysis read 11.4 CO<sub>2</sub>, 0.1 O<sub>2</sub>, and 0.0 CO, heating capacity in 16 lb per sq ft per hr averaged 32 lb on tests of 8-hr duration. It is possible that this figure can be increased providing that the material be of uniform size and continuous supply of work be maintained.

TABLE I

Comparison of Performance of Silicon Carbide Radiant Tube Annealing Furnace and a Batch-Type Furnace

	Batch Type, Gas Fired Furnace	Silicon Carbide Tube, Gas Fired, Roller Hearth Furnace
Tons annealed .....	2,435	467
Manhours .....	9,652	832
Tons per manhour .....	0.252	0.562
Furnace operating hours..	4,826	832
Heating rate-lb per sq ft per hr .....	9	30
Avg. annealing fuel cost per ton .....	\$2.93	\$1.86



**FIG. 1**—Electric furnace electrodes start in a coal mine or an oil refinery, for the basic ingredients are either coal for carbon electrodes or petroleum coke for graphite electrodes. The first step is to calcine the coal or coke in electric or gas furnaces in order to drive off volatiles, and preshrink the material. Large gas kilns are used for coke. The photo shows an electric calcining furnace for coal.

**FIG. 3**—The batches from the weigh buggies shown in fig. 2 are placed in heated mixers where binder pitch is melted and thoroughly coated over the coal or coke particles. The photo shows the discharge end of a row of mixers from which the mix is delivered to extrusion presses.

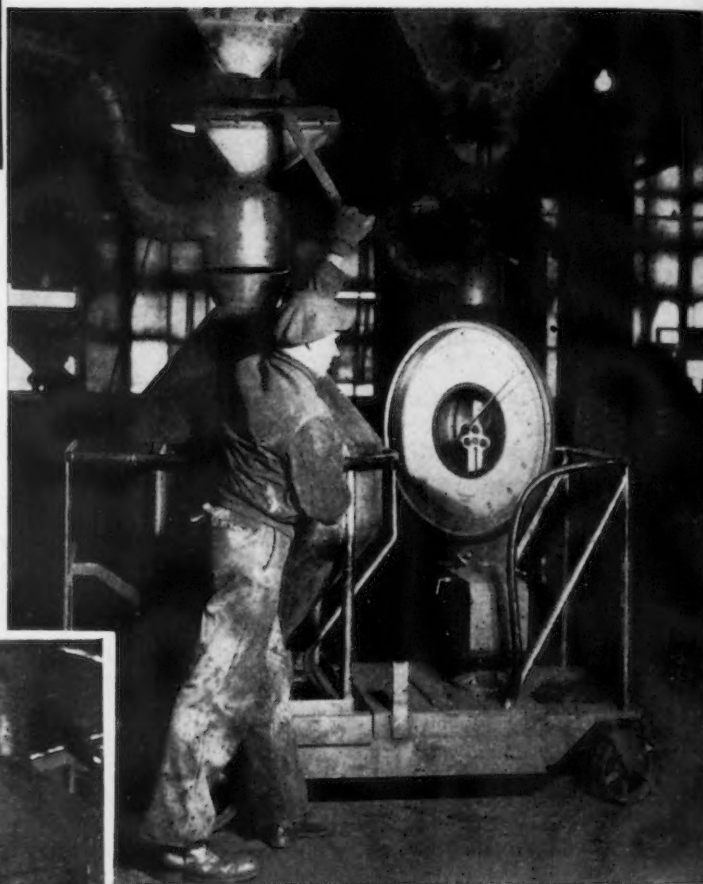


## Production of Electric Fu



The groups of basic industries served by electrodes form the background of our entire industrial structure. Every day, carbon and graphite electrodes are used to conduct large amounts of electrical energy into electric furnaces for conversion into heat to produce various metals and chemicals. The total connected power for these electrothermic applications reaches approximately 3.2 million kw, or 5 pct of the total generator capacity in the nation today.

Carbon and graphite electrodes are used because no other materials possess to the same extent the combination of electrical conductivity, refractoriness, and resistance



**FIG. 2**—After calcining, the coal or coke is crushed and screened, and particles of different size sent to their respective bins. Here is seen a weigh buggy into which various amounts of several sizes of particles are measured according to the formula for the electrode. Proper gradation of particles is very important, and will vary according to the size of the electrode.



# Electric Furnace Electrodes

By LYMAN C. JUDSON  
National Carbon Co., Inc.,  
New York

• • •

to thermal shock that is required for electric furnace operation. The following series of photographs, taken in plants of National Carbon Co., Inc., shows the manufacturing processes by which carbon and graphite electrodes are made — their conversion from raw materials to industrial application.



FIG. 6—After removal from the baking furnaces, the coal electrodes must be bored and threaded so that nipples can be screwed into the sockets to join the electrodes for continuous operation in the electric furnace. The machine shown is threading a 35-in. carbon electrode.

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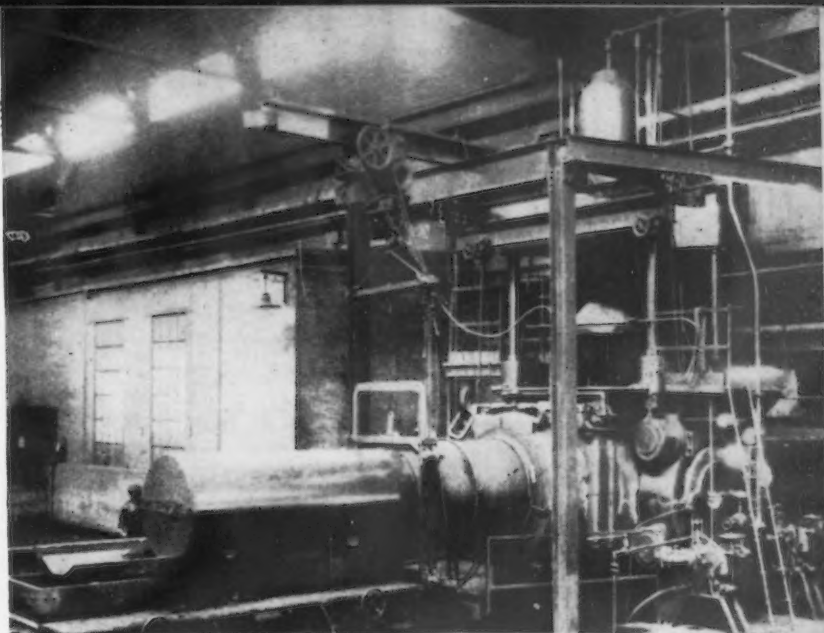
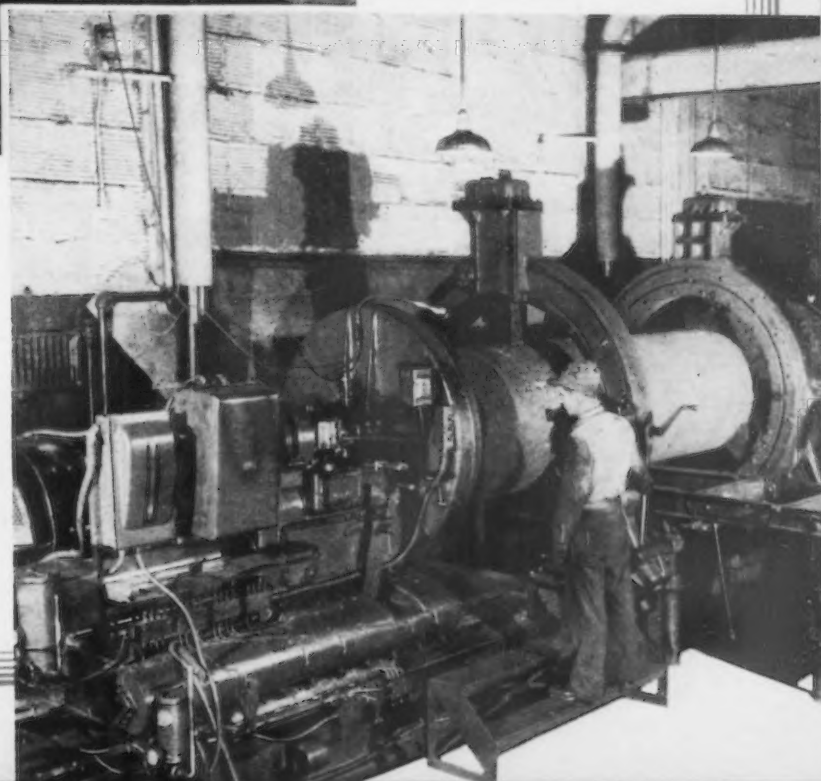
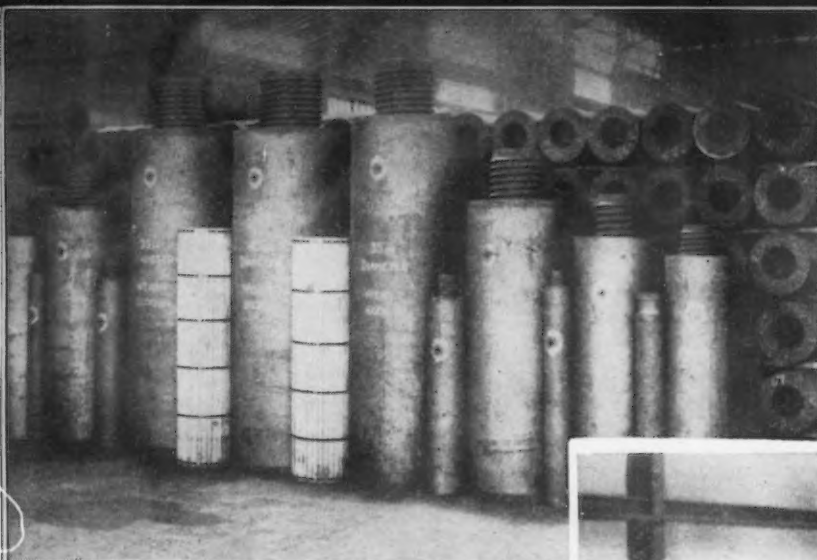


FIG. 4—Electrodes are formed in extrusion presses under thrusts of thousands of tons. The one shown is extruding a 40-in. diam coal electrode that will be 110 in. long and weigh 8000 lb. There is a large variety of electrode shapes and sizes possible of manufacture, for hundreds of dies have been designed to fit industrial needs.

FIG. 5—After they have been cooled and inspected, the "green" electrodes are placed in furnaces and fired at a temperature of approximately 1800°F to carbonize the pitch binder. This operation alone requires 30 to 47 days. Photo illustrates one of many furnace rooms in which the firing operation is carried out.

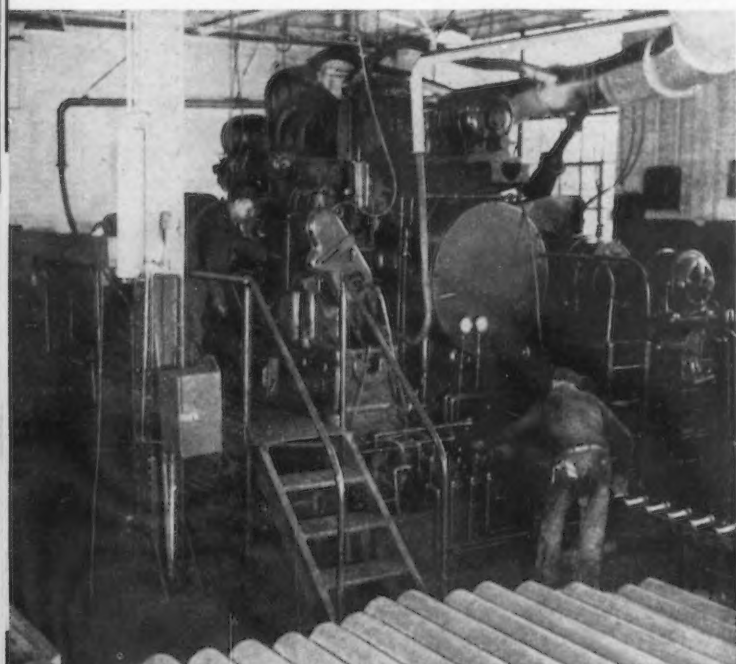
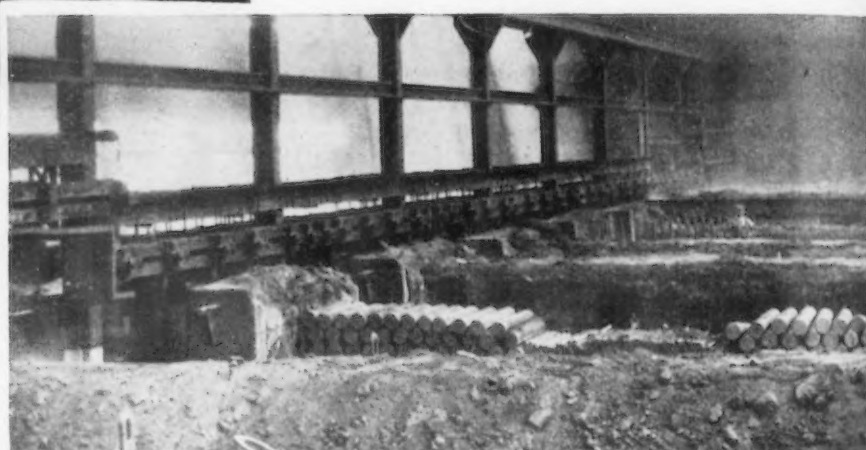






**FIG. 7**—Several sizes of carbon electrodes are shown with nipples in place. The manufacturing cycle has taken eight weeks. The center electrode is 40 in. in diam and weighs 8,000 lb. The smallest carbon electrode for electric furnaces weighs 95 lb. Carbon electrodes are used for the production of ferroalloys, calcium carbide, phosphorus, alloy steels, iron and steel castings, etc.

**FIG. 8**—For graphite electrodes, petroleum coke is used as the base material rather than anthracite. The electrodes are initially processed in a manner similar to coal electrodes. After baking, however, the electrodes are then placed in Acheson electrical resistance furnaces of the type shown and heated to temperatures over 4700°F. At these high temperatures the carbon atoms arrange themselves in the distinctive crystalline structure of graphite. This graphitizing cycle takes four weeks. The graphite electrodes are then ready for machining and finishing operations.



**FIG. 9**—Graphite electrodes are easily machined in contrast to amorphous carbon electrodes which are so hard that diamond saws are usually employed for the cutting operation. The large threading machine above faces, bores and threads graphite electrodes in continuous operation.

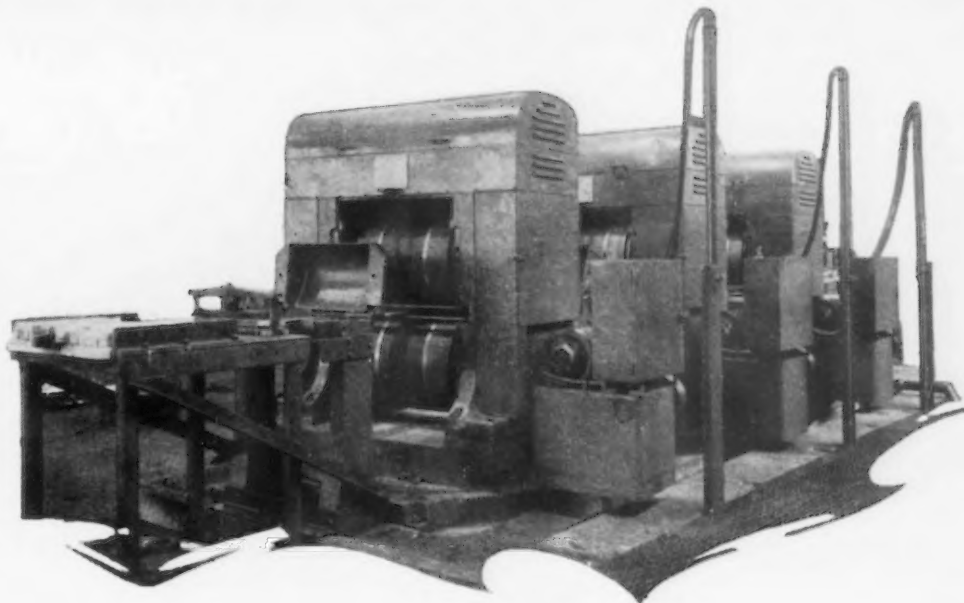
**FIG. 10**—Electrodes are assembled by screwing a nipple into the top socket of the column in the electrode holder, lowering the new electrode onto the nipple, and turning it down to make a tight joint. Final tightening is done with a special wrench. Graphite has one-fourth the electrical resistance of carbon of the same cross-section and can carry approximately four times the current. Graphite electrodes are generally employed for open arc furnaces in the manufacture of high grade alloy steels, steel and iron castings and nonferrous metals.



o o o

A three-stand tandem installation of the new Hamilton finishing machine for wet grinding sheet and strip. The pneumatic drums permit a constant abrasive pressure to be applied to the material being ground, polished or buffed. In this vein the access plates which normally cover the rolls have been removed to show the rolls.

o o o



## Wet Grinding Sheet and Strip

A FINISHING machine which will simultaneously wet grind both sides of cut or coiled sheet and strip, and which employs a diagonal grinding technique has been developed by Hamilton Pump Co., Pittsburgh. The unit is capable of handling carbon and stainless, precious metals, magnesium, aluminum and plastics. This new unit also features an oscillatory movement to break up grit line directions and pneumatic rubber drums which carry the abrasive belts. The diagonal grinding technique which the machine features permits operations from heavy grinding for removal of surface defects to polishing and buffing. It can also be used for heavy grinding for removal of surface defects prior to additional cold reduction.

Typical of this latter application was a recent test on stainless sheet bar stock where 0.005 in. from each side was removed in one pass. In scouring, a very fine abrasive action imparts uniformity to the surface conditions prior to final rolling. Final polishing or buffing can be performed by the machine, resulting in a high luster or mirror finish after final rolling. Capacities of the two existing designs of these machines allow for any of these operations on cut or coiled strip or sheet steel up to 24 or

**A new finishing machine which will simultaneously wet grind both sides of cut or coiled sheet or strip is described in this article. Employing a diagonal grinding technique, this unit is capable of grinding, polishing or buffing carbon and stainless steel, clad metal, magnesium, aluminum and plastics.**

o o o

By T. E. LLOYD

Pittsburgh Regional Editor  
THE IRON AGE

o o o

42 in. wide, throughout the full range of gages. Plans are under way for machines capable of handling material up to 60 in. wide.

A feature of the Hamilton machine is its diagonal grinding which can be altered by adjusting the machine on its swivel base. Angles up to 20° of the direction of strip travel can be established, and diagonal grinding eliminates longitudinal grit lines. This is

important not only in grinding straight chrome and other stainless steels, but also in all intermediate grindings of any type of sheet because grit lines cut into the surface parallel to the longitudinal direction of the strip are lengthened in further rolling. A double diagonal type of grinding can be accomplished by these machines which, in some cases, permits the objectional pattern in the surface of the strip to be broken up. This double diagonal grinding can be accomplished by setting two or more of the machines in tandem reversed angles.

An unusual feature of the Hamilton finishing machine is the "hypo" movement of the machine itself. This movement is an oscillatory and lesser vibratory motion and provides constant but nonrepetitive motion to the grinding surfaces. This movement not only oscillates or breaks up grit line directions, but serves to



sharpen and resharpen the cutting edges of the abrasive grain and reduces the chance of the abrasive loading.

The machines have a reciprocator base which is actuated by a reversing type motor driven screw. This base is assembled between the swivel base and the main base of the machine proper. When in operation, the machine proper moves crosswise of the strip until the edge of the abrasive covered roll nears the edge of the strip, at which time limit controls reverse the movement of the machine. By this means, full coverage of abrasive on the grinding roll can be utilized economically.

#### Pneumatic Rubber Drums

The actual grinding is done by abrasive bands wound on pneumatic rubber drums. These drums, inflated and kept at controlled pressures, are resilient and provide a cushioning effect while in contact with the work surface. This resiliency enables the abrasive to make a full cut and remove it from the surface of the sheet or strip, and also allows for uniformity of grinding in the case of slight contour or gage irregularity. The cylindrical circumference of the abrasive combined with the resiliency of the roll itself enhances the life of the abrasive material. There are no acute angles of cutting force nor any severe flexing of the abrasive belt. Drum pressures are controllable so that, within limits, any desired degree of cushioning can be obtained. Either roll can be rotated independent of the other and roll speeds can be individually regulated.

Through the use of the double pneumatic drum arrangement, the simultaneous grinding of both sides of a strip or sheet coil is possible. The amount of applied working pressure to the working surface (or amperage draw) is controlled and registered on ammeters. Both drums are opened and closed to desired distances for material thickness by automatic screwdown switches.

Another unusual feature of the Hamilton finishing machine is the application of the abrasive to the working drums. To reduce abrasive and handling costs, standard waterproof abrasive belts in roll form are used. The belt is helically wound around the circumference of the drum, the winding of which can be confined or extended to a length commensurate with the width of the work to be ground. Metal retaining bands hold the abrasive firmly after the drums are inflated.

The drum speeds of these machines are built in at 4000, 5000, or 6000 sfpm. The work speed is determined by the type of operation anticipated, but will be limited only by the speed ranges of the auxiliary coiling equipment provided. The drums, according to the manufacturer, will require renewal about twice a year and intermittent dressing.

#### Three Units in Tandem

For normal operations where average gage strip is processed, a battery of at least three machines in tandem is recommended. This provides both a graduated differential of diagonal grinding and a graduated sequence of abrasive grits, depending upon the conditioning desired. Constant level strip feed is governed by adjustable transition pass line rolls. The housings of the pass line rolls are equipped with scrubbing nozzles and squeegees, which augment the main spray nozzles in keeping cuttings and abrasives off the strip as it passes through the machines. In addition, hot air nozzles can be mounted on the last pass line roll housing to completely air dry the strip before it is coiled between the paper fillers. In heavy grinds, high pressure water spray is effective, but for uniform polished surfaces, soluble oil solutions are desirable. In buffing and polishing, where buffing belts rather than abrasives are used, emulsified buffing compounds are sprayed through nozzles rather than either water or oil.

## Refractories in the German Iron and Steel Industry

GERMAN practice in the manufacture of refractories, recently surveyed by a team of British, Canadian and American technologists, is reported in the Mar. 14, 1947, issue of *The Iron and Coal Trades Review*. The investigators are said to have expressed satisfaction that no improvements in technique for basic refractories have taken place in Germany since before the war. Many of the plants were reported to be out of date and even the more modern ones not in any way superior to British or American plants, although firing temperatures were higher than in general British and American practice.

The suspended-roof, all-basic furnace is said

to have been used with considerable success in Germany, where metallurgical conditions are less severe than in British practice, since shorter melting and refining times are required. The time from tap to tap in 35-ton and 75-ton furnaces was 4 to 6 hr, because of the use of a high proportion of hot-blown metal or active mixer metal of low sulfur and phosphorus content. No severe temperature fluctuations are met with and this also contributes towards the success of the all-basic furnace. Carbon hearths, either in block form or as rammed monoliths, are common in Germany, whereas in Britain they have only recently been introduced.



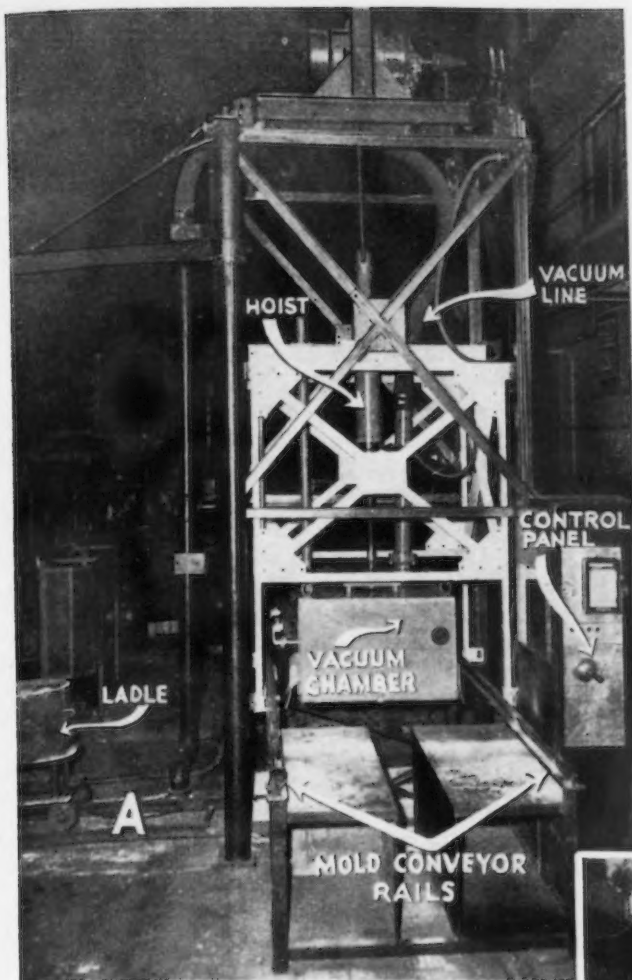


FIG. 1—The Wetherill countergravity casting unit, with the bell lowered (A), and with the bell raised (B). View B also shows the ladle in position under the nozzle.

*"The filling of the mold demands great attention and requires to be done as rapidly as practicable."*

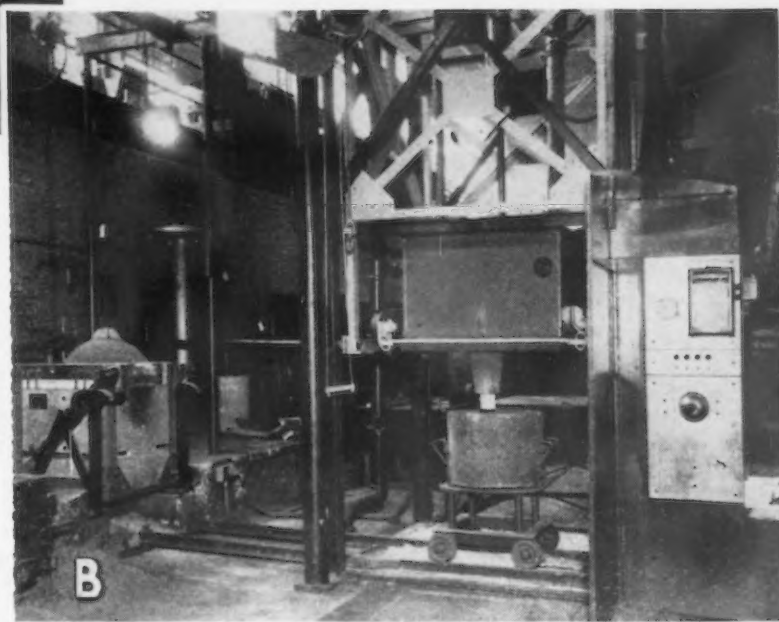
**T**HAT philosophy of metal pouring, expressed in 1869 in "The Useful Metals" is as apt today as it was then. Much time and effort has been devoted, over the intervening years, by foundrymen to perfect means of filling a mold gently, yet rapidly, and in a manner to minimize gas defects.

Many are the schemes and processes put forward to facilitate this achievement, yet pouring techniques have not changed materially over the years in comparison with the advances made in sand technology, molding, melting, etc.

However, there is in operation in the new metallurgical laboratory of the Armour Research Foundation in Chicago a unit that bears much promise of bringing to the pouring operation the same scientific controls and benefits which have in the past been realized by other foundry divisions. This unit is officially entitled the "Wetherill countergravity casting process," but can be

# Wetherill Vacuum Casting Process

By W. A. PHAIR  
Technical Editor  
THE IRON AGE



described in more simple terms as a method of pouring by use of vacuum.

Representing the culmination of 7 years of intensive research and development under the sponsorship of the Wetherill Engineering Co., Philadelphia, and other industrial organizations, this unit makes possible the pouring of up to 500 lb of iron or steel in 9 sec on a production basis.

The use of vacuum to expedite pouring is not a new conception. It has been tried before, and is used to a limited extent by the precision casting industry, but it has failed to attract widespread use through the lack of adequate controls and a means of incorporating it into a production setup.

These objections, however, appear to have been

overcome in the Wetherin-Armour unit. This unit, in its essentials, consists of (see fig. 1) a steel framework enclosing a second vertically moving steel frame which supports a pouring plate and a vacuum bell. An air hoist, supported by the main outer structure, is used to raise and lower the inner movable steel frame. An air operated piston raises and lowers the bell. A pair of rails provides a means of handling a mold in and out of the unit and a centralized control panel (fig. 2) is located alongside the main structure. A vacuum pump is installed separately and is connected to the unit with flexible hose.

This equipment provides a means whereby a mold, arranged to feed from the bottom up, may be placed inside the vacuum bell, after which a nozzle, attached to the bottom of the mold, is immersed into a ladle, the vacuum applied and the molten metal sucked up into the mold cavities. This entire operation, with an average mold taking from 250 to 500 lb of metal, requires slightly under 1 min, with the filling of the mold cavity occupying from 9 to 12 sec of this time, the exact time depending on the nature of the piece being cast.

The foregoing brief description of the physical unit and the operating method ignores a tremendous number of very difficult technological and mechanical problems which had to be solved before the machine reached its present state of development. A more detailed description of a typical operating cycle suggests some of the problems which were encountered and overcome. This discussion of an operating cycle is necessarily based on practice at the metals laboratory of Armour Research Foundation and would likely be modified in several respects in production work.

The first step involves assembly of the mold (dry sand corework in this example) on two runner slabs, as shown in fig. 3. These runner slabs house channels for feeding the four stacks of

molds from the nozzle mounted beneath the slabs, in the manner shown in fig. 4. The castings being produced in the example covered in this discussion are brake shoe heads weighing, finished, 10 lb. They are cast two in a mold (as shown in fig. 3), 24 castings to a plate.

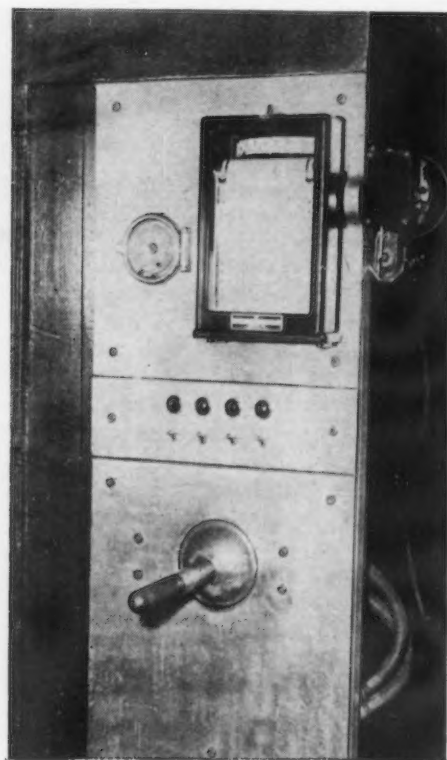
The nozzle, fig. 4, through which the metal feeds into the mold, consists of an outer metal sheath and an inner tube of refractory material. The joint between the nozzle and the runner slabs is sealed with ordinary foundry paste, as is the runner slab to mold gate joint. The pressure of the mold clamps, shown in fig. 5, on the paste, provides an adequate and safe joint.

After the mold is assembled on the slab, suitable clamps are put on and the entire pouring plate is rolled under the vacuum bell, as indicated in fig. 5. The operator, by manipulating the single control lever, lowers the bell over the mold.

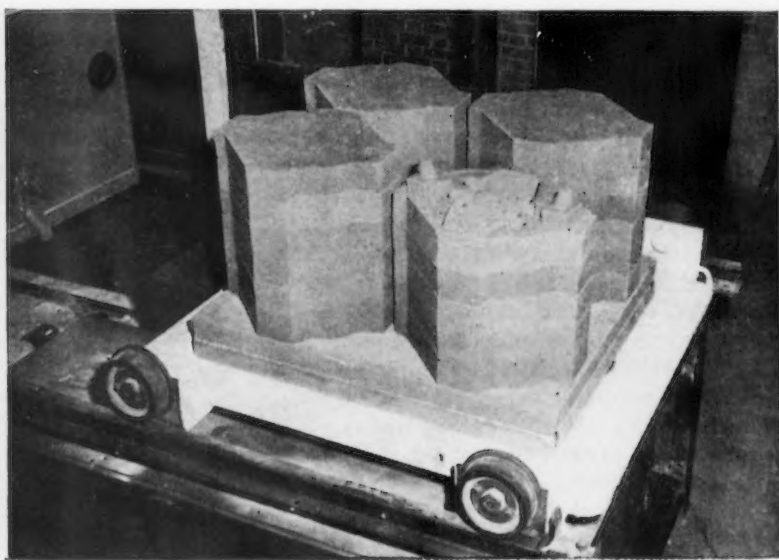
The ladle (see fig. 1B), which runs on tracks at right angles to the mold tracks, is then moved into position under the nozzle. The operator then lowers the entire assembly of vacuum bell, pouring plate and a short rail section until the nozzle end is perhaps an inch above the metal surface. At this point an automatic skimmer is employed to move the slag from the metal surface immediately beneath the nozzle and the nozzle is simultaneously lowered about 3 in. (the extent of the bare refractory section shown in fig. 4) into the molten metal.

Vacuum is then applied to the bell and the metal moves up into the mold at a rate controlled by the rate at which the bell is evacuated. The mold platform and bell are lowered progressively as a unit as the level of the metal falls in the ladle, maintaining the nozzle at 3 in. below the molten metal surface.

The mold is held in this state for a short period after it is filled to permit solidification of the castings and partial solidification of the gates



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ABOVE

FIG. 3—Assembling a mold on the pouring plate. This mold consists of 12 dry sand sections each containing two castings.

LEFT

FIG. 2—Control panel of the vacuum pouring unit.



**Better yields, reduced foundry losses, improved operating conditions and rapid production pouring are among the advantages attributed to a vacuum casting method developed by Armour Research Foundation for Wetherill Engineering Co. This process is said to provide a gentle yet rapid filling of the mold from the bottom up in a manner which minimizes gas porosity and provides complete, reproducible control of the operation. This article explains the construction and operation of the Wetherill unit and describes a typical steel casting pouring cycle.**

and risers. Following this interval the vacuum is shut off and the mold platform is raised and a certain amount of metal still liquid in the gating system is permitted to drain back into the ladle.

The succeeding operations involve simply raising the bell and rolling the mold out of the unit to the rear, and feeding another in through the front. Pouring of this particular mold of brake shoe heads takes 1 min total elapsed time, with 45 to 50 sec required for the complete pouring phase. The actual filling of the mold takes place in 10 to 12 sec (included in the 45 to 50 sec interval).

It is apparent that the drainage of metal from the gates and risers results in a substantial increase in yield, yet at the same time is a critical operation. In practice, the interval for holding the mold to avoid draining out parts of the casting proper is readily ascertained and reproduced consistently by the automatic controls.

Data covering a large number of casts of brake shoe heads show a net yield of solidified metal of

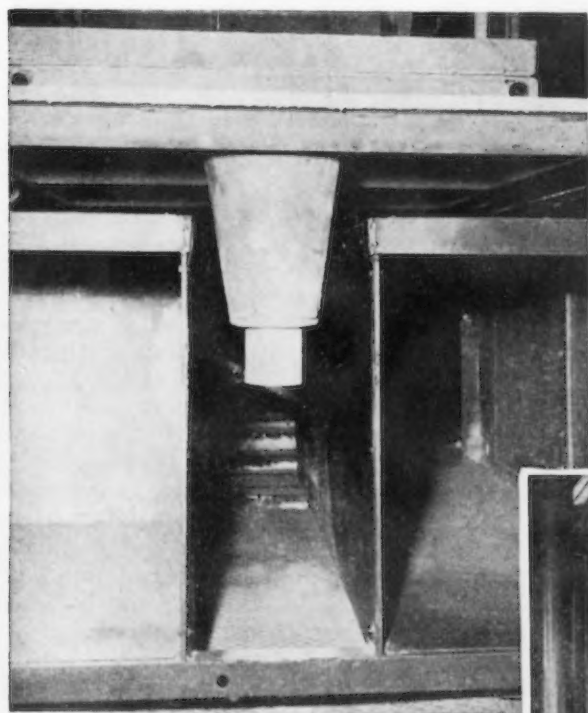
80 pct, as compared with 55 to 60 pct which would result in normal gravity pour methods. A recent series of six consecutive molds of 24 castings each was produced with 97 pct net good castings. Experience to date indicates that an average foundry loss of  $2\frac{1}{2}$  to 3 pct can be maintained on this type of work. Fig. 6 illustrates a cast of 24 brake shoe heads. Note the drained runners and gates, and the absence of fins.

The key to the successful operation of the Wetherill unit is in the control devices. The control panel itself (fig. 2) is extremely simple. One lever controls all functions of the unit: moving the lever up raises the mold platform; lowering the lever lowers the platform. Moving the lever to the left lowers the bell; to the right raises it. Twisting the handle grip in one direction applies the automatic skimmer, twisting it in the opposite direction applies the vacuum.

The row of switches and signal lights controls the circuits of the various motors, while an electric timer is located alongside the vacuum strip chart recorder. The timer automatically times the duration of the vacuum interval. The control circuits of this unit, which are largely electric, are necessarily somewhat complex, but do provide the constancy of the cycles so vital to obtaining reproducible results. In short, this control system appears to provide, for the first time, positive mechanical control of pouring.

The application of the vacuum, including the rate at which it is built up, is adjustable over a wide range. Specific vacuum cycles are established, by experimentation, to suit a specific casting. There is, as yet, no common formula for establishing this factor. The vacuum used in this process depends on the height of the casting or castings. A head of 4 to 6 in. of steel is normally maintained.

Another interesting aspect to this technique



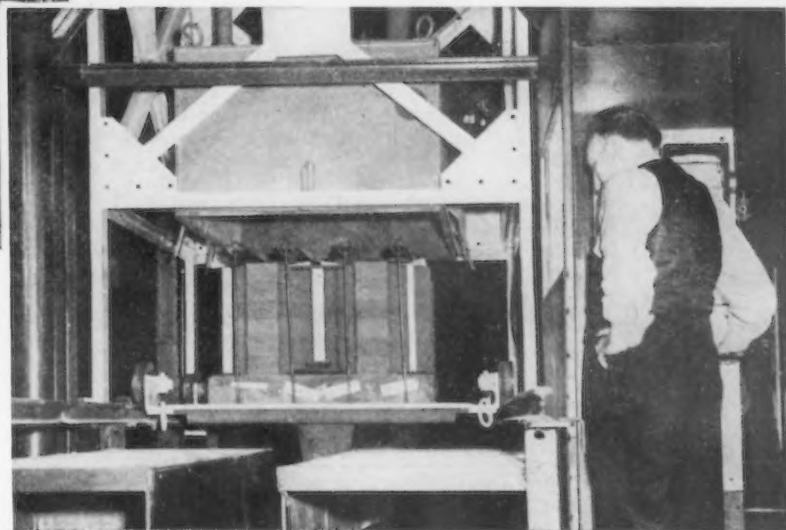
ABOVE

FIG. 4—Pouring nozzle which is lowered into the molten metal. The nozzle feeds into the two runner slabs visible on top of the pouring plate.

o o o

RIGHT

FIG. 5—Clamped mold in position beneath the vacuum bell.



is that vacuum time may, if desired, be limited to allow atmospheric pressure to operate on risered castings through a Williams head.

In the course of the development of this pouring unit, practically the entire gamut of cast metals has been poured, including nonferrous, gray iron and steel, in metal molds, green sand molds and dry sand molds. More than 1200 heats of cast steel have been produced, with experimental castings ranging in weight from 2 to 100 lb.

The brake shoe heads, used to illustrate the pouring cycle previously described, are a particularly apt part for emphasizing some of the more important aspects of the Wetherill counter-gravity casting unit. Because of the ability to pour light sections with assurance of sound metal and



ABOVE

FIG. 6—Brake shoe castings produced in the molds shown in figs. 3 and 5. Note the drained gates

RIGHT

FIG. 7—A comparison of fluidity test bar strips poured by usual gravity methods (set to the left) and by Wetherill counter-gravity method (set on right). A ratio of about 2:1 or better in length of strips filled was obtained in the counter-gravity poured strips over corresponding gravity-poured strips.



completely run sections, it was possible to redesign the part using a number of areas with a section of thickness of  $\frac{1}{8}$  in., yet still meeting service requirements.

The primary advantages of the Wetherill vacuum pouring technique may be summed up as:

- (1) Increased yield of good castings is obtained because of better control over pouring conditions.
- (2) Permits redesigning to thinner sections due to facility with which such sections may be run.
- (3) Some improvement in yield is possible with certain castings because of metal draining out of liquid runners.
- (4) Reduces defects attributable to slag, and to pin holes or porosity.

The reduced foundry loss may be attributed to the fact that control of the filling rate provides smooth and quiet entrance of metal into the mold cavity during the early stages of the casting cycle, thus reducing the turbulence common to gravity pouring and the resulting erosion of mold and core surfaces. This mechanical control of the pouring cycle obviously eliminates

many variables common to manual pouring.

The action of the vacuum also tends to provide relatively lower resistance to the filling of mold due to the less dense mold gas, and the constant evacuating of mold gases generated by the hot metal.

The difference between the fluidity of steel poured by the counter-gravity method and the conventional gravity method is aptly illustrated by the comparison of the test bar strips shown in fig. 7. The gravity-poured set of strips is shown to the left and the counter-gravity to the right in this photograph. The strips, which are 14-in. long and vary in thickness from  $\frac{1}{16}$  to  $\frac{1}{2}$  in., are arranged in a different order along each of seven runners leading from a central sprue. The two sets of strips were poured under identical conditions, including composition, casting temperature, and total filling time, except for the method of pouring. The experiment was repeated several times with nearly identical results in favor of the counter-gravity method shown in fig. 7. A ratio of approximately 2:1 or better in the length of strips filled was obtained in the counter-gravity poured strips up to  $\frac{5}{16}$  in. thick over the corresponding gravity-poured strips. There was also some advantage in the heavier counter-gravity poured strips although less pronounced than in the lighter strips.

The concept of completely mechanical pouring embodied in the Wetherill unit raises a number of other interesting possibilities. For one thing,

the hazard of handling molten metal is reduced, as the single pouring operator is protected from runout, splash and explosion by the glass and metal shield visible in fig. 1 alongside the control panel.

Confinement of the pouring operation to a restricted area and the mechanical arrangements improve working conditions in the foundry by eliminating dust and heat exposure, an important fact in consideration of contemporary labor relation trends.

The highly mechanized features of this unit, plus the limited manipulation of the ladle required, suggest that maximum efficiencies of the unit could be realized if more complete control of the temperature of the metal could be provided. Appreciation of this fact led the designers of the unit to include, as an integral part of an installation of this unit, an induction heated ladle. The metal in the ladle could thus be maintained at an optimum pouring temperature at all times.

It is also worth noting that in the design of this unit primary consideration has been given to perfecting an arrangement that could be readily inserted into a continuous molding line.



# The Economic Significance of Direct Reading Spectrochemical Analysis

By M. F. HASLER

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ALMOST every metal producer has at some time or other given considerable thought to the economics of composition control, with regard to both impurities and alloying constituents. This consideration is only natural in view of the large losses which can result when metal is out of chemical specifications.

Thus in the early thirties every large scale reduction plant, every smelter and refiner, and every alloying plant, had its inevitable chemical laboratory providing postmortem analyses that indicated which metal had to be remelted and adjusted to come within usable specifications. Often in large plants these laboratories were formidable affairs employing from 10 to 100 chemists and operating over three shifts. Many efforts were made to speed up established methods and to devise new simpler methods which would cut the costs of chemical analyses. However, the limitations imposed by reaction rates, represent such a basic barrier that no great strides were made to reduce materially the time of analysis. Certainly not many attempts were made during this period to hold the metal in the molten condition while its composition was being checked.

In the years immediately before World War II, the concept of high-speed analysis was given considerable study and several promising lines of approach were worked out based upon physical methods and the necessary attendant instrumentation. Of all available methods, the spectrographic one showed particular promise for two reasons. First, in metal analysis, no dissolution of the sample is necessary, since a piece of metal may be prepared by a simple high-speed machining operation. Second, though several steps are involved, the spectrographic method is essentially a "one shot" operation, in which the analysis of all elements is registered simultaneously. In other words, the analysis of one element does not have to wait upon some action of another. This is particularly important in the case of complex alloys in which perhaps a half

**The economic aspects of the use of direct-reading instruments for spectrochemical analysis are discussed in this article from a practical viewpoint. Various metal producing capacity classifications are considered from the standpoint of offering savings in operating costs and laboratory costs, since advantages of high-speed analysis are related, to some degree, to plant size. Reference is also made to benefits that can be realized from the high degree of composition control possible, resulting in substantial reductions in scrap losses.**

dozen alloying constituents need be checked together with a number of impurities.

During the war the spectrographic method really came into its own. This was due to a general acceptance of a single standard method of analysis and large scale production of the instruments necessary for all of the steps of that method. Six operations are involved:

- (1) Sample preparation, with lathe or sander.
- (2) Sample excitation with spark or arc unit.
- (3) Spectrum photography with spectrograph.
- (4) Photographic development.
- (5) Spectrum measurement with comparator-densitometer.
- (6) Final percentage calculation with calculator.

The total time to complete all these steps from start to finish when a single sample is involved is thus about 10 min—1 min for operation No. 1, 30 sec for operations Nos. 2 and 3, 5 min for operation No. 4, and 3 min for operations Nos. 5 and 6—though the exact time depends somewhat on the number of elements to be determined. From this short time of analysis the concept of so-called "speed analysis" has arisen—analysis so rapid that a furnace can be held until the composition of the alloy has been checked. Economically this means that say 15 min of fuel costs and overhead per melt per furnace must be balanced against the elimination of scrap. Actually it turns out considerably better than this. Not only can these holding costs be absorbed but some very worthwhile profits can be made out of this elimination of scrap loss.

Besides these direct production savings, many

indirect benefits resulted during the war years. Laboratory costs and particularly laboratory personnel could be held to a very low figure per sample analyzed. In fact, it is probably no exaggeration to say that the physical job of analyzing the metal produced during the war could not have been accomplished without the aid of spectrographic analysis. Manpower, space, and equipment just could not have been mustered to do the job chemically.

It was with these basic facts clearly in mind and the realization of the enormous job facing the metal producing industry in 1942 that the Applied Research Laboratories was prompted to start development of a direct-reading instrument for spectrochemical analysis. It was apparent that the two basic advantages of the spectrographic method—elimination of sample solution,

tized in a very short period. It is largely on this basis that a direct-reading instrument can be justified.

What is the order of magnitude of such costs? Considerably more is involved than just the direct-reading instrument itself. In the first place, since once this instrument is installed production will hinge entirely on it, it must be adequately protected against careless workmen, air pollution, humidity, changes of temperature and sudden variations of input voltage. This implies a separate, air-conditioned room and some device for adequate control of voltage, such as a large motor-alternator set. Also, in order to realize the full advantage of speed analysis, a pneumatic system usually has to be installed between the direct-reading instrument room and the various furnaces for the transmittal of samples and re-

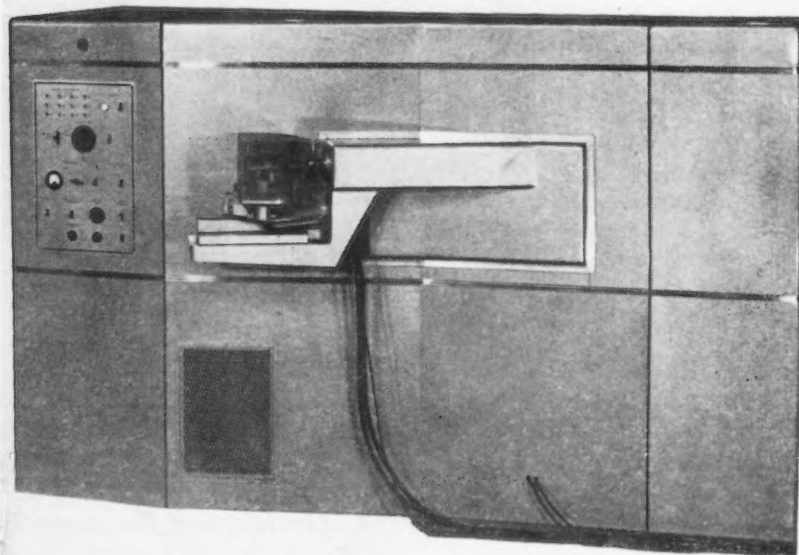


FIG. 1 — Typical spectrometer of direct reading equipment where sample is sparked and spectrum is produced.

and the "one shot" character of the process—could be capitalized in direct-reading apparatus. At the same time, if electrical light-recording could be employed, instead of photographic recording, then the 5 or 6 min utilized in developing time could be eliminated. Also if the process could be made truly direct-reading, then further time spent in taking readings and making calculations could be eliminated. Unfortunately for the war effort, development was hindered by manpower shortages and the realization that the production of spectrographic equipment had to be given first preference.

With the basic problem of perfecting a direct-reading instrument solved, and with the growing availability of such instruments, their probable effect on the economics of metal production can be considered. If holding a furnace for 15 min while an analysis is being made is good economy, then cutting this time to one-third, or 5 min, is still better economy. Also, if not one but 10 or 20 furnaces are involved, then the savings become of such magnitude that even a very large initial instrumentation cost can be amor-

ports. In a large plant this in itself can cost a considerable amount. On the personnel side, despite the fact that many analysts can be dispensed with for production control, one new man must be added—an electronics engineer. He will have to be adequately trained in the maintenance and servicing of the direct-reading equipment. Thus the costs of such an installation can easily run from \$50,000 upward.

However, the credit side of the ledger can quickly wipe out these costs and start to show a profit. Consider the specific case of a steel mill where possible savings can be estimated as follows. During the refining process no savings would result from having very rapid preliminary analyses, as these tests can proceed while refining takes place. The first important analysis from the standpoint of time saved is that just prior to the slag-off. If the various residuals have been brought down to specifications, the oxidizing slag can be removed and the deoxidizing slag put on the heat. Thus, if carbon can be determined by a high-speed method in a few minutes, and all other constituents by a direct-reading instru-



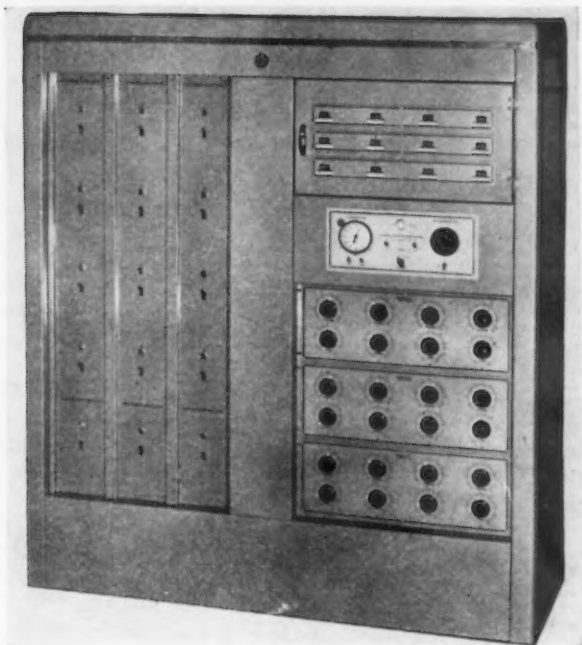


FIG. 2—Recording console of quantometer where chemical composition is read.

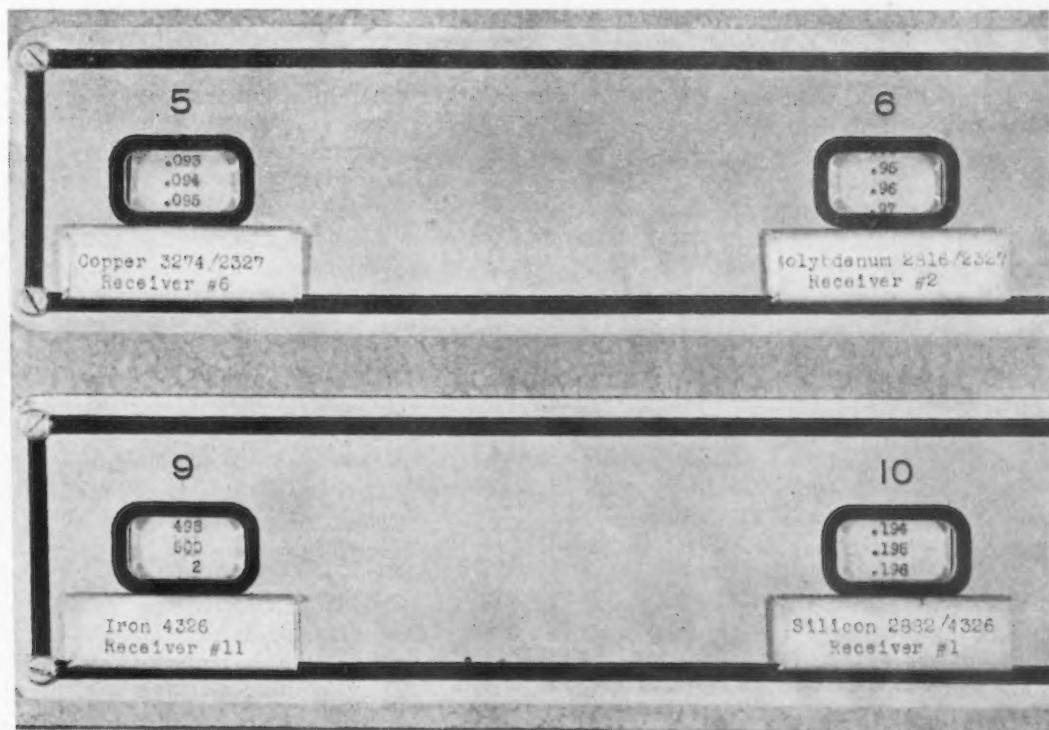
ment, about 10 min of furnace time can be saved at this point. If the values of the analyses are such as to allow slag-off, then these same analyses can be used to determine the correct additions to be made to the melt to produce steel to specifications. The second analysis which can save time is the final sample analysis before tapping. Again about 10 min of furnace time can be saved.

Thus, in the operation of a large electric furnace, about 20 min could be saved in every melt of from 5 to 8 hr with a direct-reading instrument. If operating costs, overhead, and depreciation amount to \$5 or \$6 per min, this would represent savings of over \$100 per melt per furnace. Since one quantometer can handle up to ten furnaces efficiently, savings up to several thousand

dollars per day could readily be realized in a large steel mill. In evaluating these savings it is important to realize that they represent savings above what could be realized with the most modern spectrographic laboratory. Savings in cases where reliance is still placed on a "wet lab" can amount to several times this figure.

On this basis direct-reading instruments can readily pay for themselves in a matter of a few months after they start to control production. Because of this the initial cost should not be the prime consideration. The all important point should be the reliability of the equipment, the ease of maintenance and repair, and the accuracy of analysis consistently provided. Apparent savings on the original installation can be costly in the long run.

FIG. 3—Close-up of direct readings showing copper, molybdenum and silicon percentages in steel.



## What Method to Use?

*Nitriding?*

*Gas Carburizing?*

*Pack Carburizing?*

*Liquid Carburizing?*

# Practical Aspects of S

**W**HILE it is readily granted that there are other methods of obtaining a hard surface on steel parts besides pack, liquid or gas carburizing or nitriding, this article covers only the well-known methods whereby the composition of the surface layers is altered, during a heating period, by the surrounding atmosphere in the furnace. These common methods include the various methods of carburizing and nitriding.

There has been a great deal of information published concerning the processes which involve the altering of chemical composition in the surface layers by the addition of silicon and even chromium, but so far these newer processes have not come into general use, due to their various limitations, so that they will not be discussed. It is also possible to obtain hard surfaces by the application of localized heat (such as may be obtained by induction or flame) on a material, which is capable of being hardened to the desired degree without any alteration of composition. This method is very much a study in itself and shall not be discussed here as a common method for surface hardening.

In order to meet the requirements of certain engineering demands it has been necessary for the metallurgical engineer to produce steel parts which possess a hard, wear-resisting surface and at the same time a core which is relatively soft and ductile. Since steel at elevated temperatures is quite active chemically, the most common practice used to fulfill such engineering demands has always been to start with a steel low in carbon content and by heat treatment to alter the composition in the surface, so that the exterior of the parts either becomes hard at the time or at least is capable of being hardened by further heat treatment.

In the earlier part of this century the old pack carburizing method of surface hardening began to give way to rapid improvement. Not only were there improvements made on the pack carburizing process in the line of better equipment and activated packing material, but great strides were also made in the liquid carburizing and gas carburizing processes. In the middle twenties the nitriding process was developed to the point where it became of great practical value to the manufacturer.

Now that we are in the postwar period it seems logical to review the progress which has been accomplished in practical methods for surface hardening, so that their advantages and limitations can be clearly presented.

A study of surface hardening methods quite readily indicates that the practical applications for the various methods so overlap in many cases, that many parts lend themselves to being hardened in a satisfactory, as well as economical manner by more than one of the common surface hardening processes. In a majority of cases, when the many influencing factors are taken into consideration, the various processes are actually not competitive. Each process, to a great extent, has a particular scope of work to which it is best adapted and the user will find that in order to practice economy and at the same time produce the desired results a study of the processes should be made. It therefore becomes quite a problem to the person who is contemplating the purchase of heat-treating equipment, unless the particular person is entirely familiar with heat-treating practices, to know just what process will best fill the requirements and in turn what type of equipment to purchase. Such a situation places the purchaser of equipment in a position where he is either forced to employ an experienced consultant who has no interest in equipment sales or to eventually use his best judgment after obtaining figures and statements from various sales representatives.

In order that an intelligent selection of a surface hardening process and the subsequent purchase of suitable equipment can be made, it is absolutely necessary that many factors be taken into consideration. While there may be still other factors worthy of consideration, the author feels the most important are: (1) design in parts, (2) type or types of steel to be hardened, (3) depth of case desired, (4) desired physical properties in case as well as core, (5) permissible variations in case depth, (6) volume of work to be processed, (7) whether the heat treating will be a one, two or three-shift operation, (8) finish necessary on parts after heat treatment, (9) desired corrosion resistance of finished parts, (10) type of quench available or desirable, (11) cost of fuel or electricity in the particular locality, (12) experience of operating personnel, (13) available cleaning



# of Surface Hardening Methods

**The possibilities and limitations of pack carburizing, liquid carburizing, gas carburizing and nitriding are discussed from the practical metallurgist's viewpoint, in this article. An attempt is also made to show that although these four methods do overlap in the work they can economically perform, in general they are not competitive and each method is intended for a definite role in the surface hardening of steel parts. Pack and liquid carburizing are discussed in this first part of a two-part article.**

equipment, (14) whether parts are to be hardened all over or locally, and (15) method of stop-off to be used for locally hardened parts.

After the above list of factors is considered, it may be readily assumed that no one method of surface hardening could possibly excel in all respects. In larger plants where a wide variety of work is being done, it is not at all uncommon to

*Additional articles on surface hardening were published in THE IRON AGE as follows: "Characteristics and Uses of Salt Baths," Feb. 14, 1946; "Gas Carburizing," Part I, Oct. 18, 1945, Part II, Oct. 25, 1945, Part III, Nov. 1, 1945; "Maximum Carbon in Carburized Cases," Oct. 11, 1945.*

find all four of the common methods of surface hardening being used at the same time.

## Pack Carburizing

Pack carburizing will lend itself to almost any design, though it is especially adaptable to intricate parts and those which have a wide variety of section thickness. This is due to the fact that heating is done very slowly, thus inducing less unbalanced stresses during the period of time in which the parts are brought up to temperature. The pack method will likewise lend itself to carburizing most any type of steel. It is not usually considered as economical for shallow case depths; that is, less than about 0.035 in., due to the fact that there is such a large mass of material, including the boxes and carburizing compound, which must be brought up to carburizing temperature.

A wide variety of physical properties can be produced by the pack method. If best core properties as well as case properties are desired, the work may be quenched directly from the carburizing temperature and subsequently reheated to

By H. E. BOYER

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American Bosch Corp.,  
Springfield, Mass.*

1450° to 1500°F, and requenched. This double treatment is not used nearly to the extent that it was a few years ago, though it is still practiced in some plants. A more common procedure is to allow the work to cool slowly in the carburizing boxes and then reheat to a suitable temperature prior to quenching. Another variation which is often practiced is to decrease the temperature of the entire charge from the carburizing temperature to a suitable quenching temperature and then open the boxes and quench directly. There is no getting around the fact that there will be a great deal of variation in case depth by the pack carburizing method, due entirely to temperature gradient within the carburizing boxes. Especially for large boxes, a great deal of time is required for temperature equalization. This nonuniform case depth condition will, of course, be less noticeable in deeper cases since the carburizing rate is slowed up as the case depth increases. This is another reason for the pack process being considered as impractical for light case depths.

Fig. 1 is a chart showing the relation of case

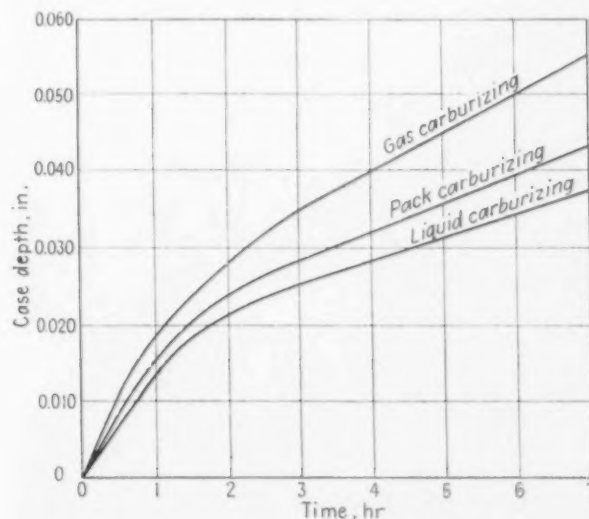


FIG. 1—Chart showing time required to obtain various case depths by three different methods of carburizing SAE 4617 steel. Curves plotted from data obtained with use of production furnaces.

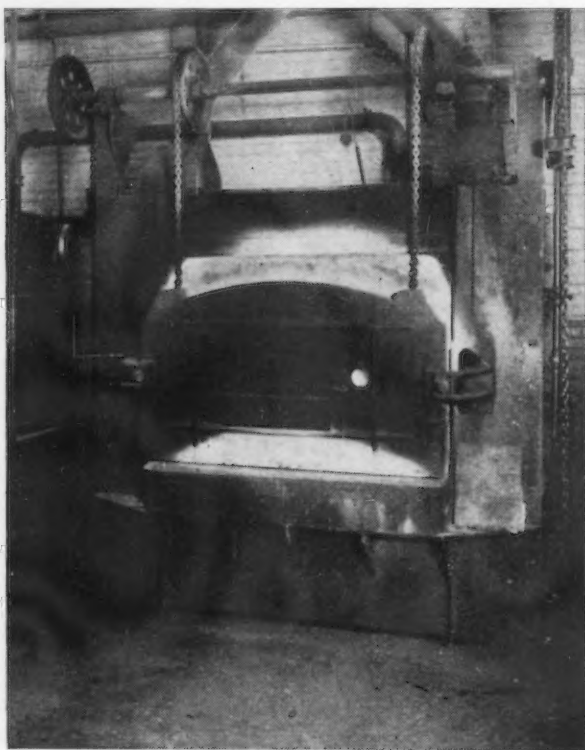


FIG. 2—Oil-fired box-type furnace used for pack carburizing. Photo courtesy American Bosch Corp.

depth to time at carburizing temperature for three different carburizing methods. The steel used for test was SAE 4617 and the temperature at which the packed specimens were carburized was 1650°F. It is granted that there may be some inaccuracy in this chart especially in case of the pack carburized specimens, because it is always difficult to determine just when the entire box has reached a uniform temperature. A more rapid rate of carburizing can be obtained by using the higher temperatures of 1700° to 1750°F, but since maintenance of the equipment is much more difficult as operating temperature is increased, 1650° to 1700°F, is the most widely used temperature range for pack carburizing.

Volume of work is always an important factor in a comparison of carburizing methods. In order to gain maximum efficiency by the pack method it is necessary that the work be available in sufficient quantities to charge the furnace completely. It is also desirable that all the parts for one charge be similar, so that one pre-determined time can be used for the entire heat. The number of shifts or portion of the 24-hr day over which the heat treating shop is operated, also has a bearing on the type of surface hardening that can be most economically employed.

Due to the time required for packing, loading, and bringing the furnace and charge up to carburizing temperature, it is almost impossible to carry on pack carburizing in single shift operation. Most plants find that it can be accomplished successfully in two shifts because it frequently works out quite satisfactory to pack, load, and bring to temperature on the first shift,

then to carburize through the remainder of the first shift and probably a part of the second, depending on the desired case depth. The cooling cycle can then be started during the second shift and carried on through the night, so that whether or not there are any third-shift operators is not usually important.

The color of parts after pack carburizing is usually a bluish-black, but should be entirely free from scale, so that if they are directly quenched the only scale after hardening will be that which formed in the time period of 1 or 2 sec occurring between the carburizing box and the quenching medium. Parts cooled in the boxes and reheated by means of a neutral salt bath will possess a very good finish, entirely free from scale. An atmosphere controlled furnace is also quite suitable for reheating and can produce parts which are relatively clean. The only disadvantage is that when a charge is withdrawn from the furnace the parts are entirely without protection during the brief time that they are exposed to air before going into the quench. When salt is used as a heating medium, the parts will come from the furnace with a sufficient coating to act as a protective layer for the parts until they are in the quench. Pack carburized parts offer no particular resistance to corrosion unless they are reheated in a salt high in cyanide content after which they will be mildly resistant to atmospheric corrosion.

The type of quench used is no particular factor in case of pack carburizing, since the parts processed by this method may be quenched in salt, oil, water or brine depending upon the composition of the steel. The only exception is for alloy steels which are commonly quenched in salt (marquenched). If they are slow-cooled, they must not be reheated in a salt containing high percentages of cyanide.

Since furnaces used for pack carburizing may be either electrically heated or fuel fired, this becomes merely a matter of which is cheaper in the particular locality. Fig. 2 is a photograph of a typical pack carburizing installation which is fired with oil. This unit is also a very satisfactory annealing furnace.

While it is always advisable to have experienced personnel for any heat-treating operation, surface hardening by pack carburizing does not demand much skill and technical training as some other methods. If simple rules are followed with the aid of good equipment, it should not be difficult to produce satisfactory and consistent results.

Since parts, as they come from the carburizing boxes, are relatively clean, the cleaning equipment necessary is dependent on the method used for the subsequent hardening operation. Most salts used for reheating are water soluble so that hot water will usually suffice. Grit blasting is an excellent method for cleaning heat-treated parts which have been processed in an atmosphere controlled furnace.

It is true that pack carburizing is usually considered more expensive than the newer gas and liquid carburizing methods. Whether or not this is true is dependent on the factors as discussed above, but there is one part of the field where



pack carburizing has always been, and still is, superior to the newer methods. For many parts it is necessary that carburizing be confined to certain areas, so that some areas must be stopped off or insulated from the action of carburizing gases. Most of these insulating materials are satisfactory only when the parts are packed carburized. A great deal of work has been done to develop materials which will be effective in gas and liquid carburizing media, but so far, they have been only partially successful. Those which are in any way successful by the two latter methods are usually difficult and expensive to apply.

For the manufacturer who has a great deal of localized carburizing to do, pack carburizing may still have to be employed. It has been the experience of more than one manufacturer to find that some pack carburizing equipment had to be reinstalled after it had been entirely discarded in favor of newer methods. The reason for this was usually that the newer methods could not satisfactorily perform where localized carburizing was necessary.

### Liquid Carburizing

Liquid carburizing has been developed to a rather high degree of flexibility during recent years. The term *cyaniding*, which was the original term for case-hardening steel in a liquid salt bath, still persists in many plants though due to the enormous improvements which have been made in this process the term liquid carburizing is well deserved. This process has become rapidly more popular during the past few years due to the development of a wide variety of salt compositions, as well as improvements in the furnaces used to heat the salts, so that a great many of the disadvantages which formerly limited the scope of the liquid carburizing process have been eliminated or at least minimized. There are several types of furnaces which may be used satisfactorily, though many heat treaters have found that the newer immersed electrode type is far more satisfactory in the long run because of its more efficient heating principle as well as the decreased maintenance cost.

A typical installation of the immersed-electrode type is shown in fig. 3. The initial cost of such an installation is usually greater than one of the externally-fired type, but if the equipment is to be used in regular production this cost will be rapidly canceled off by the decreased expense of operation. First, the life of the pot is markedly increased because of there being no impinging flames or direct heat from heating elements to cause deterioration, and second, the heating is actually done from within the bath so that heat losses are decreased, lowering the power costs. It should also be mentioned that immersed electrodes promote a natural stirring action within the bath, so that there is far less chance of temperature nonuniformity than will be encountered in a salt pot which is heated by external methods. There are in operation many liquid carburizing baths which are heated externally by either gas, oil or electricity, and which produce very satisfactory results.

A typical installation of this type is illustrated in fig. 4. The furnace shown is an oil-fired automatically controlled temperature installation containing an alloy salt pot of 14 in. diam x 14 in. deep. A furnace of this type is usually more satisfactory if heated by oil or gas rather than electricity, due to the fact that the gases from fuel combustion help to prevent rapid deterioration of the pots (which is bound to occur when continually exposed to electrical heating elements).

Another disadvantage of heating such a furnace by electricity is that when a pot failure does occur and considerable quantities of salt are allowed to leak through, the electric furnace is likely to suffer greater damage than in the case of a similar pot failure in a fuel-fired installation. Some heat-treating plants use pressed steel pots for externally-heated salt baths, though it has been the experience of the author that the heat-resisting alloy pots, even though their initial cost is greater, are more economical to use because of the greatly increased pot life. For immersed-electrode installations, the pressed steel pots are quite satisfactory and usually give long service.

When surface-hardening methods are being compared, design of the parts to be processed should always be taken into consideration. While the liquid carburizing process lends itself to processing parts of many different designs, more distortion can be expected in very intricate parts, with heavy and light sections, due to the extremely rapid method of heating, as compared to the rate of heating by the pack carburizing



FIG. 3—Liquid carburizing installation heated by immersed electrodes. Photo courtesy American Bosch Corp.

method. While this condition can usually be minimized by proper technique and with the aid of fixtures or holding facilities, the rapid heating, even though it is uniform, does tend to warp parts of intricate design. Another cause for excessive warpage in the liquid process is that the work is usually quenched from a carburizing temperature of 1550° to 1650°F, which is somewhat higher than is employed in the reheating of pack carburized work.

Any type of steel that can be carburized by either of the three methods will usually give satisfactory results by the liquid process. As to the depth of the case, this is governed by two variables; (1) carburizing temperature and (2) type of salt used. Carburizing temperature is in turn governed by the type of salt used. Since a discussion on the different types of salt would be a paper in itself, the author will not attempt to discuss this phase in detail.

#### Liquid Carburizing Temperature

Probably the most universally used temperature for liquid carburizing is 1550°F. Higher temperatures will naturally carburize faster, but as the temperature is increased the breakdown of the salts increases, so that temperatures of 1600° to 1650°F are not usually practical. The lower curve on the chart, fig. 1, shows a typical example of the case depth which may be obtained in a given time by the liquid method. The steel used for this test is SAE 4617 and the carburizing temperature 1550°F. The salt in the furnace at the time was a blend of two commercial salts, one of which was a 75 pct sodium cyanide without barium salts, and the other was a 60 pct sodium cyanide containing barium and carbon.

The author has found that a 50-50 mixture of these two is a very practical salt for general liquid carburizing practice. It will carburize somewhat faster than the 75 pct variety alone and will wash with much greater ease than the 60 pct with barium and carbon when used by itself. Such a mixture when bailed and replenished once per 8-hr shift, plus whatever replenishing is necessary to compensate for drag-out losses, should give results similar to those shown in fig. 1.

It may be readily observed from the curves that carburizing does not take place as fast by the liquid method when compared to pack carburizing. This is particularly true as the case becomes deeper. It should, however, be taken into consideration that the results shown by these curves are based on the time at heat. In case of liquid carburizing, particularly for small parts, the time required for the work to assume carburizing temperature may be only a few minutes, while the period may be an hour or more (depending upon the size of the carburizing box) when the pack method is used. In many instances, small parts requiring only a shallow case can be liquid carburized, quenched, washed and probably in the tempering furnace in less time than the same type of work could be packed and brought to temperature by the pack method. It is obvious that the liquid carburizing method is usually

found far superior for the processing of parts demanding only a light case, at least, as far as economy is concerned.

Particularly in case of the alloy steels such as 4617, 8620 and 3316, very good physical properties can be obtained in the core as well as the case, by the liquid method. Double treatments such as were described in the discussion on pack carburizing are not as convenient to use by the liquid method. Quenching from 1550°F will usually give desired physical properties on the usual carburizing grades. It is becoming quite common practice to process medium carbon steels such as 4140 and 8640 in a liquid carburizing bath to produce a file-hard surface with a somewhat softer core.

One difference existing in the case characteris-

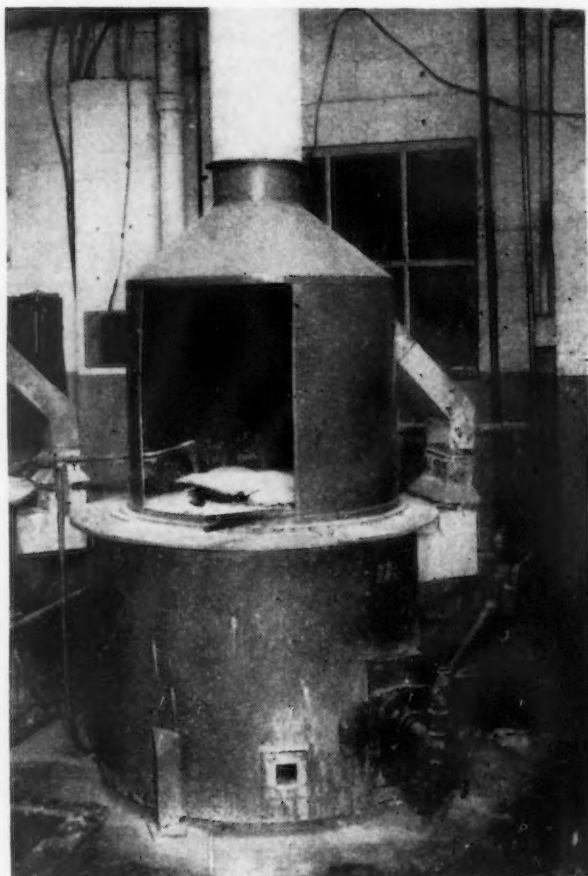


FIG. 4—Liquid carburizing installation, fuel fired.  
Photo courtesy American Bosch Corp.

tics of a liquid carburized part as compared to a similar part pack carburized is the lack of carbon diffusion by the liquid method. That is, the case obtained by the liquid method shows a higher concentration of carbon and a more abrupt change from case to core due to the rapidity at which the part was brought to temperature and quenched from the carburizing temperature. In the instance of packed parts, box cooled, the tendency is for the carbon to diffuse inward after the carburizing action has slowed down or stopped. For most applications the carbon concentration in the surface layers is not regarded as an important factor, though oftentimes specifications are drawn up which do require the car-



bon concentration to be within certain ranges at a given depth.

If the furnace and temperature control equipment is maintained carefully and the condition of the carburizing salt is guarded, as described in the foregoing paragraphs, there should be but little variation in the case depth from one carburizing heat to the next, provided, of course, that the steels are of like composition and grain size.

When volume of work is considered, it can be stated that the liquid process is extremely flexible, and especially lends itself to being very practical for handling parts which differ over a wide range of design and desired case depth. This feature is especially attractive to the small manufacturer who has a wide variety of small lots. In the liquid process there are no furnace doors to close and open so that to carburize parts to different depths of case is merely a matter of tagging the holding fixture or hooks with the predetermined time of removal. Unless a large work load is charged at one time, there is little change in temperature, so that the carburizing of a variety of different parts can proceed rapidly in the same heat. This process also lends itself to

the processing of large volumes of work which is all similar. In this case it is just a matter of selecting a furnace with sufficient capacity to turn out production at the rate desired.

While most heat-treating operations can be much more efficiently carried on by operating for at least two 8-hr shifts, the liquid carburizing operation will lend itself to single-shift operation better than will the other carburizing processes, especially if a watchman or someone can turn on the furnaces prior to the time the regular operating personnel start their day. To refer to the salt baths which are heated by immersed electrodes, it is usual practice not to turn them off, but to merely turn the controls down to a temperature just sufficiently high to keep the salt in a molten condition. If the salt is allowed to freeze it is necessary, unless a starting coil is inserted before turning off, to melt down a pool of salt around the electrodes before the bath can be started.

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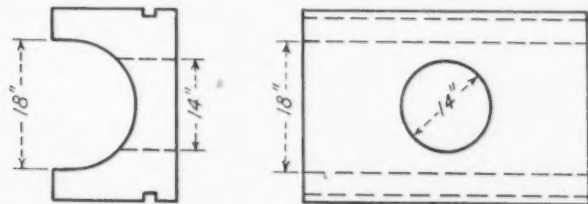
*In a subsequent issue, the author will continue his discussion of liquid and gas carburizing and nitriding.*  
—Ed.

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## Minimizing Die-Block Distortion Resulting From Hardening

CONSIDERABLE difficulty has been encountered by the Kentucky Steel Treating Co., Louisville, in the hardening of large die blocks having an impression machined out to form a half-round and also having a hole running perpendicular to this surface. See accompanying sketch. The inside diameter would close-in on the 18-in. diam, due to the general design of the die, the movement usually averaging  $\frac{1}{8}$  in. and occurring in spite of draws to relieve machining stresses, extreme care in heating, etc.

The steel used was of the 0.30 C, 1.00 Si, 5.00 Cr, 1.25 W, 1.35 Mo, hot-work, air hardening



**SKETCH** of a die-block design which has offered considerable difficulty for hardening without excessive distortion.

type, and was air quenched from 1875°F (1 hr at heat) after being preheated thoroughly at 1500°F. Rough machining before hardening and finish machining after hardening was not practical in this case, since the hardness requirement for this type forming-die is 50 Rc.

T. F. Burch, metallurgical engineer, reports that in order to overcome this movement in hardening, a mechanical means was resorted to in the form of hardened bars acting as stops. The bars were approximately 3-in. rounds and were machined to length to fit into the 18-in. diam at each end of the die with radii at either end to conform to the rounded impression. These bars were usually made slightly undersize in length or to the low tolerance of the die blueprints and were of a hardenable grade of steel, preferably hot-work steel, due to their being subject to heat in use, and were hardened to about 50 Rc prior to use.

After the die is removed from the furnace and air quenched to about 1000°F, the inside diameter begins to close-in, due to contraction in cooling. The bars are then inserted into each end of the die and as cooling and contraction continue, this movement is checked to the extent of the bar lengths. As the steel die continues to cool in the quench to about 500°F, the Ms point, it ceases to contract and begins to expand again. This expansion relieves pressure on the bar stops and they may be lifted from the die with tongs. As the die continues to cool to room temperature, further contraction takes place and dimensions within tolerance result.

Other dies previously hardened with the closing in occurring, were then annealed and re-hardened, utilizing the bars already made, and were also satisfactory as to dimensions.

# New Lock Joint for Sheet Metal Structures

A NEW type of mechanical joint formed as an integral part of the metal sheet which is said to represent a complete departure from conventional sheet metal assembly methods and provides opportunities for better design, as well as overcoming disadvantages of rigid assemblies utilizing rivets, screws or welded construction, is described in the article "The Cookson Lock Joint" in *Sheet Metal Industries* (London) May, 1947.

This lock joint, illustrated in fig. 1, was developed by W. Cookson and consists of two parts which include a spring clip section (A) formed

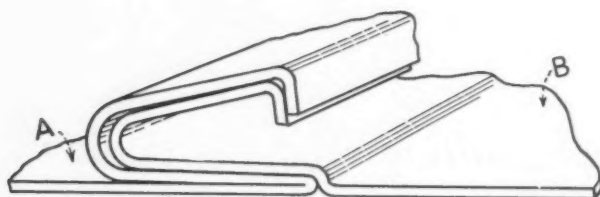


FIG. 1—The Cookson lock joint consists of two parts: a spring clip section (A) and a lock section (B). The joint is made by snapping the lock section into the clip and is held securely by engagement of lips.

on the edge of one piece of metal and a lock section (B) formed on the edge of the corresponding piece. The joint is made by snapping the lock section into the clip and is held securely by the engagement of the lips. To disengage the sections, the lock is slid out of the clip longitudinally. Curved lock joints are constructed on the same principle. To form a rectangular corner, the flange from which the lock is formed is bent at right angles to the sheet. Manufacture of the clip and lock sections on the edges of sheet metal is accomplished on a lock forming machine which is said to be essentially an adaption of an ordinary type of folder incorporating suitably shaped form bars.

When locked together, the joint forms a column which adds rigidity to the assembled unit. The column is on the inside, preferably at the corner, and consequently on products such as cabinets where interior space is confined, interior access is not required for reinforcement or bracing. This feature has additional significance, it is said, particularly in the case of interior wall panels, as the joint may be made with a smooth exterior finish without screw or

rivet heads. Because of spring construction, the lock joints have controlled resilience and are free to move under temperature changes.

Using the Cookson lock joint, parts can be completely finished before assembly and it is comparatively easy to spray and dry or enamel flat panels with conveyor belt production techniques. The parts can then be assembled without injury to the finished surfaces. As assembly of components by this system requires no tools or assembly jigs, articles may be assembled at the plant or at the destination with unskilled labor. All parts made by the lock joint method have reinforced edges so that cabinet panels, for instance, do not need more than ordinary handling care in the unassembled state. This permits articles such as metal shipping boxes to be returned in an unassembled condition after shipment.

In the building field, partition walls can be made by the use of the lock joint method of connecting panels together. Double-wall partitions made on this principle have hidden resilient joints of flush outside appearance and can be assembled by unskilled labor as they are self-aligning when pushed together, even when placed in position at an angle to each other. Wall panels may be designed, the article states, for quick dismantling by interrupting the lock at intervals to allow disengagement.

Other opportunities for better design and efficient production are said to be offered with this method of sheet metal fabrication. For example, the welding of aluminum alloy sheet is sometimes troublesome because of softening and buckling of the metal. Time taken for dressing up the joint is usually a variable factor, so it is sometimes difficult to estimate the complete cost of making each joint.

Lock joint construction permits much pattern development work to be done in the drawing room, eliminating time and material often wasted in shops when sheet metal workers use empirical methods. Working drawings with accurately dimensioned pattern developments can be made with lock joints to eliminate much of the roughing-out, according to the article. In this manner, the correct amount of material required for a production run can be estimated. A blank of accurate dimensions is obtained by reproducing the developed pattern on metal in the toolroom which eliminates the necessity of tool tryout runs. Planning is facilitated as many time factors can be ascertained before the job reaches the shops.

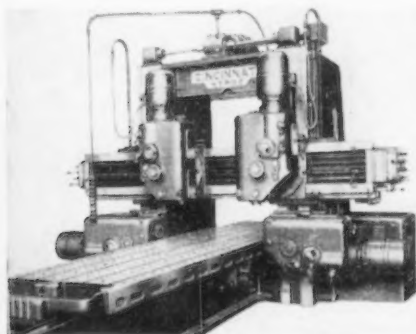


# New Equipment...

**Planer type milling machines, horizontal hydraulic bulldozers, double end chucking machines, automatic screw machines, die handling lifts and gear finishers are described in the following pages, together with inert arc-welders, welding shutoff valves, an annular marker, bright finish for zinc, and various material handling equipment.**

## Planer-Milling Machine

WITH a new type drive on the 48 x 48 in. x 12-ft hypro planer type milling machine, which has been announced by the Cincinnati Planer Co., Cincinnati 9, it is said to be possible to increase or decrease head or table feeds while cutting as may be determined by the work piece through conveniently placed direct reading speed control dials mounted in the operator's pendant station. Change from feed to traverse, increase or decrease feeds without gear changes, clutches, etc., is possible from the centralized movable pendant station. Automatic spindle load con-



trol with feed tachometers is an added feature to aid productive capacity of the machine. Feed rates are automatically changed to suit various width surfaces to maintain constant horsepower. Transmission of power to the table is through Hypro combination herringbone and cone worm wheel drive which is said to provide an anti-backlash, self-locking unit without side thrust.

## Horizontal Bulldozer

ANNOUNCEMENT of a 400-ton welded steel horizontal hydraulic bulldozer, designed for structural shops, implement plants and general application throughout the heavy metal working industry

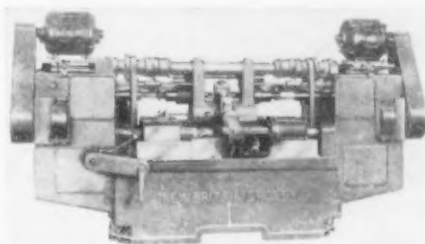
has been made by Beatty Machine & Mfg. Co., Hammond, Ind. The machine features a high operating speed, in relation to its heavy size. Stroke is 24 in. and maximum open-



ing measures 60 in. Speed is variable, controlled by hand lever or foot pedal. Stroke adjusting rod collars allow the machine to be set for predetermined ram travel. Resistance lug is keyed and bolted to the table and ram guides are of the angle type, mounted out of the way of the press table. The main cylinder is single action, forged steel, and the piston is cast semi-steel. The machine is furnished with double acting rapid-advance cylinder, variable pressure and variable delivery pump mounted on welded steel oil tank.

## Double End Chucking Machine

MODEL 365 double-end tool rotating chucking machine released by New Britain-Gridley Machine Div., New Britain, Conn.,

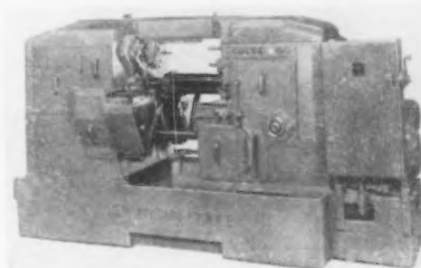


features automatic chucking and unchucking, precision alignment of opposing spindles, accurate threading, quick indexing, rapid traverse

on all late motions, and fully interlocked safety controls. The new model has 3 working spindles on each side with a central work holding fixture. Threading is done in the third position and is controlled either by positive cam or lead screw. Two opposite ends of the same piece can be machined simultaneously with assurance of alignment between the machined ends, according to the manufacturer. Speeds up to 2000 rpm have been provided to make the machine suitable for machining nonferrous metals and the machine is said to have sufficient rigidity for carbide tooling.

## Automatic Screw Machines

MAJOR improvements in quick setup and changeover, carbide tooling, interchangeability of tools

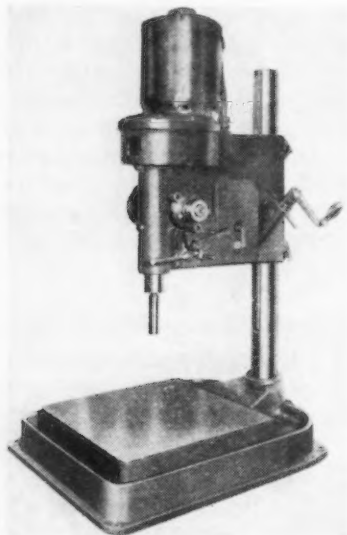


as well as improved automatic features are claims made for a new line of multiple spindle automatic screw machines introduced by New Britain-Gridley Machine Div., New Britain, Conn. Six independently-cammed cross slides are radially arranged about the axis on the spindle carrier, making possible the same line of forming thrust for every position, minimizing overhang, and allowing interchangeability of holders among the five heavy-duty forming positions. Cam changes are not required for a change in stock feed length and a universal tool slide cam eliminates cam changes for the main tool slide. By adjusting a calibrated

dial, any ratio of feed to approach may be obtained without changing the high point or drawback point and therefore, tool holders need not be repositioned, according to the manufacturer. This line is designed for carbide cutting tools; 1¼ and 2¼-in. sizes are available.

### Bench Tapper

A PRODUCTION bench tapper of compact construction, announced by the *Buhr Machine Tool Co.*, Ann Arbor, Mich., features selective full automatic cycle or hand operation with safety clutch, which reduces tap breakage to a minimum, it is claimed. Change gears make all threads possible in tap diameters from No. 4 to 5/16



in. in cast iron, or ¼-in. steel, with Class 3 fits under normal conditions. The ball bearing motor is ½ hp, 1800 rpm, 3 phase, 220 v. Dimensions of the tapper are: swing, spindle to column, 10⅞ in. clear; spindle diameter, 1⅝ in.; max vertical travel 2 7/16 in.; base 17 x 22½ in. with coolant trough.

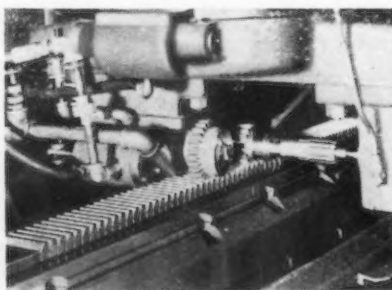
### Die Handling Lift

DESIGNED to facilitate the handling of die sets, the E-Z lift safety flange announced by *Superior Steel Products Corp.*, 2754 S. 19th St., Milwaukee, as standard on all Superior die sets, has the bottom grooved. On small sets that can be lifted by hand, the operator inserts his fingers in the grooves instead of sliding the set to the edge of the bed and tilting it. Danger of smashing fingers in picking up and putting down sets is said to

be eliminated. With larger sets, lifting hooks lock into the grooves of the flange, a feature said to save time and prevent sets from sliding out of the sling during lifting.

### Gear Finisher

SIMULTANEOUS finishing of two or more gears in tandem with an improved rack type gear finisher has been announced by *Michigan Tool Co.*, 7171 E. McNichols Rd., Detroit 12. Designed



to approximately double the productive output per hour of this type of gear finisher, this duplex type machine is hydraulic in operation with a duplex head and tailstock which permits one gear to be mounted between centers and another on a stub arbor immediately ahead of the centers. The hydraulic clamping provided for the centers is interlocked with the machine operation so that the machine cannot be started until the gears have been mounted. Quick-lock type mechanical centers are also available. To shave two or more gears at a time the gears must be of the same pitch and pressure angle but they may be of different diameters and face width. During the shaving operation the machine head gradually feeds down until proper size has been reached, the machine reciprocates a few more times, and then stops for re-loading. The finisher will handle passenger car or truck transmission gears.

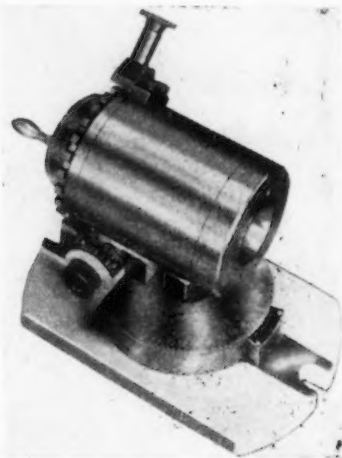
### Dial Indicator

SUITED for use on comparators and fixtures for controlling close tolerances, a quadrant type dial indicator with standard mounting dimensions has been announced by the *Standard Gage Co., Inc.*, Poughkeepsie, N. Y. This instrument, designated as Micronar is said to have an unusually high amplification ratio for an instrument of

the dial indicator type. The scale of the English unit model is divided into 0.0001-in. steps and in the central portion these intervals have been subdivided to 0.00002 in. Consistent repeatability and accuracy in keeping with these fine divisions is claimed for the instrument.

### Collet Head

A UNIVERSAL dividing collet head for grinding and milling is now being manufactured by the *Matco Tool Co.*, 2834 W. Lake St., Chicago 12. Special features include a graduated base, Torrington precision needle bearings, and a hardened and ground index plate. Standing 5¼ in. high, this dividing head has felt seals for dust protection and takes up to 1-in. capacity in ground thread collets. Applica-



tions include angle, flat and hexagon milling and grinding and with attachments can do collet grinding on external grinders, sharpen mills and can be used for diamond dressing radii and angles on grinding wheels, it is claimed.

### Offset Tool Holder

FOR facing and boring operations difficult to perform with straight ejector type carbide tool holders, *Super Tool Co.*, 21650 Hoover Road, Detroit 13, has developed a line of offset ejector tool holders. These tools hold a carbide insert without clamping strains, it is said, and allow the chips freedom from interference with the clamping mechanism. Due to the compound angles at which the insert is held, economy in regrinds is said to be achieved and without the wheel contacting the steel holder.



### Marking Machine

THE No. 203 marking machine manufactured by *Jas. H. Matthews & Co.*, 3954 Forbes St., Pittsburgh 13, has been developed for precision marking on cylindrical or cone-shaped machine tool feed dials, cylindrical sleeves, optical devices and similar parts. A motor-driven machine and a bench model hand-operated machine are available. The motor-driven unit is designed for marking parts up to approximately 6 in. in diam with the usual combination of graduation numbering and lettering usually appearing on such parts. The hand-operated machine will mark graduations and numbers on small parts up to 3 in. in diam. In both models the part to be marked is placed over the mandrel and locked in place.

### Portable Electric Drill

A 1/4-in. palm drill has been added to the line of Metal-master portable electric drills manufactured by *Bradford Machine Tool Co.*, Cincinnati 4. The drill has been designed for one-hand operation and features a hand-fitted pistol grip. A trigger switch for intermittent use, which can be locked for continuous operation or released with one finger, is incorporated in the grip. The drill is equipped with ball bearings and



heat-treated chrome-moly steel helical gears are used. A 3-jaw Jacobs chuck is provided. Drill capacity is 1/4 in. for steel and a 110 v ac-dc motor drives the drill at 1100 rpm with full load.

### Inert Arcwelder

TYPE WP 220-440 v, ac welding transformer developed by *General Electric Co.*, Schenectady, N.Y., has been introduced primarily for welding with the inert-arcwelding

process on aluminum, magnesium and beryllium copper in an atmosphere of argon gas without the use of flux, and may also be used to weld other metals and alloys. The welder is suitable for manual and machine operation. Welding transformer, control panel, capacitors



for power-factor correction, a bank of series capacitors to stabilize the arc, a pilot spark circuit for arc starting, and water and gas solenoid valves are built into a single compact unit. After initial adjustments are made on the control panel, components of the welder are operated by a foot treadle permitting the operator to concentrate on the welding operation. Welders can be mounted on an optional three-wheel running gear for portability.

### Temperature Controller

AN ELECTRONIC pyrometer controller for electronic heat control of furnaces, melting pots, kilns and other heating devices using electricity, gas or oil has been announced by *Illinois Testing Laboratories, Inc.*, 420 N. La Salle St., Chicago 10. Designated the Alnor controller, it is described as a precise instrument for both production or laboratory operations. Pyrometer movement is double-pivoted on jewelled bearings. The unit includes a 6-in. mirrored scale, and has a dust tight and water-proof case.

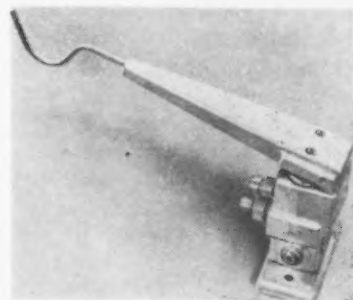
### Low Temperature Electrodes

DEVELOPMENT of two steel welding electrodes called low temperature Eutectrodes 66 AC and 660 DC for arc welding steel at low

base metal heat, has been announced by *Eutectic Welding Alloys Corp.*, 40 Worth St., New York 13. Distortion is said to be kept to a minimum which eliminates holding fixtures and jigs and rejects are reduced because of low base metal heat. These electrodes are flux-coated, produce a smooth, high tensile, crack-resistant weld and are particularly suitable for vertical position welding, according to the manufacturer. The electrode has been developed to eliminate the necessity for determining the base metal before welding and is described as a universal rod for all types of steel. Preheating is said to be unnecessary. Eutectrode 66 is available in 3/16, 5/32, 1/8 and 3/32 in. diam.

### Welding Shutoff Valve

DESIGNED to cut down argon consumption in production Heliarc welding, the Oxweld V-30 dual shut-off station valve developed by *Linde Air Products Co.*, 30 E. 42nd St., New York 17, controls both argon and water supply. It is operated by an extension lever on which the torch is hung when not in use. Since in Heliarc welding, argon is required only when welding is actually in progress, with this valve the argon and water supply are shut off when the torch is hung on the hook. The valve has



a self-sealing type of packing designed to operate for long periods without maintenance or leakage. The V-30 is recommended for operating pressures up to 100 psi for both argon and water. Each valve is supplied with an adjustable base for wall or bench mounting.

### Conveyer Chain

A FLAT-TOP conveyer chain for packaging and handling operations has been designed by *Wade-Morrison Co.*, 18401 Shaker

Blvd., Cleveland. Each link of the chain is the same, eliminating the need for special coupling links. The top plate which is the carrying surface, also acts as the side bar of the link. This is said to minimize the number of parts and consequently the number of cavities, which facilitates cleaning. All parts of the chain are made to close tolerances and the top surface is ground after assembly to assure a smooth surface. The chain is available in 1½-in. pitch and any width of top plate from 3 to 7½ in. The chain may be obtained in carbon steel or in Type 304-18-8 stainless steel.

### Power Conveyor System

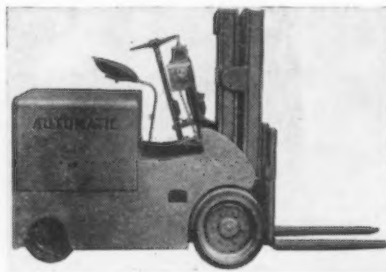
**A**UNITIZED portable power conveyer system developed by *Food Machinery Corp.*, Riverside, Cal., has been designed for quick setup or disassembly to handle loads up to 100 lb per ft. The system is built around a basic power unit made up of a standard 10-ft straight section powered by a ½-hp slow-speed motor. This unit combines with various accessories and with an accordin gravity conveyer. Accessories include 90° power turns, automatic power conveyer intersection, piling conveyer base, power feed attachment, and a gravity take-off attachment. For truck loading and unloading, the portable unit is assembled as a stacking or piling conveyer. For more complicated problems, all units can be combined to operate from several different floor levels with all conveyer lines feeding into one main conveyer line.

### Platform Power Truck

**A** 6000-lb capacity electric, platform model power jacklift has been announced by *Lewis-Shepard Products Inc.*, 293 Walnut St., Watertown 72, Mass. The truck is controlled from the handle head and may be operated with the handle in vertical or any other position. It is stated that no movement of the handle is required to start, stop, change speed, or lift and lower the load. Vertical handle operation is reported to save up to 18 in. in aisle space. The master drive unit of this model is a separate interchangeable unit.

### Fork-Lift Motor Truck

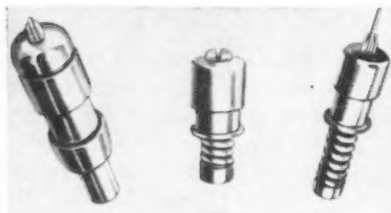
**D**EVELOPED for shippers, manufacturers and carriers using motor trucks and trailers, a fork lift motor truck introduced by



*Automatic Transportation Co.*, 149 W. 87th St., Chicago, is capable of tiering to truck and trailer ceilings as low as 68 in. while offering a total lift of 100 in. The truck is a modification of the Skylift, electric fork truck manufactured by the company. It is available in 2000, 3000 and 4000-lb capacity. Overall collapsed height of the truck is 68 in. and the forks lift to 52 in. before telescopic action increases overall height. Telescopic lift is 100 in. it is claimed.

### Skin Fasteners

**S**KIN fasteners which are spring actuated and designed to temporarily hold metal sheets together, with 50-lb pressure, and in position preparatory to permanent assembly, have been introduced by *Aircraft Tools, Inc.*, 2306 E. 38th St., Los Angeles 11. They can be applied



or removed easily by one individual, it is said, from either side of the work. Sizes range from 3/32-in. hole size to ¼ in. for material thicknesses ranging from ¼ to 1 in.

### Bright Finish For Zinc

**U**NICHRROME Clear Dip, a chemical treatment for new zinc plate, has been developed by *United Chromium, Inc.*, 51 E. 42nd St., New York 17. It is said to produce a brilliant conversion coating on ordinary zinc plate, tests showing the treated zinc withstands

more than 50 hr of standard salt spray exposure without dulling or formation of white corrosion. The process is fast, with good results obtained at room temperature, it is reported. Actual dipping time is from 5 to 20 sec, with several water rinses preceding and following the dipping. Acid-proof or suitably coated tanks and dipping baskets are used. Treated surfaces are non-finger marking and have excellent shelf-life, it is reported. The treatment is said to form an excellent primed surface for any clear lacquer or pigmented organic coating.

### Annular Marker

**C**OMBINING a solid stamp and interchangeable type, a stamping device for annular marking has been introduced by *New Methods Steel Stamps, Inc.*, 147 Jos. Campau, Detroit 7. With this marker, parts such as gears, bushings and sleeves can be stamped around the radii with such information as the part number and trade mark together with variable data, in the same marking operation according to the manufacturer. In addition to use in hand stamping work, the marker incorporates a press mounting adapter permitting it to be used on practically all types of presses for machine stamping. The marker consists of a mounting adapter, and a bushing stamp carrying standard information and mortised to take interchangeable characters for the variable data.

### Beryllium Alloy

**A**NNOUNCEMENT of a new heat-treatable beryllium alloy, known as Berylco 165 alloy, has been made by the *Beryllium Corp.*, Reading, Pa. The new alloy is said to meet every performance requirement of the ASTM specification B 194-46T, and is offered in two forms: the regular age-hardening Berylco 165S, and the same alloy mill-hardened and designated Berylco 165ST. The latter requires no heat treatment and is said to have ductility to stand extreme forming operations. The heat-treatable alloy can be used for any stamped, drawn, formed or blanked part calling for ASTM grade material. In both forms, final properties and workability of Berylco 165 depend on temper.



# CLEVER PLANNING REDUCES SCRAP- SPEEDS MANUFACTURE

THIS photograph shows progressive steps in the manufacture of a clock frame, and is an excellent example of careful planning to reduce the amount of scrap and lessen the number of operations. Note that in only a few strokes of the machine not only is a plate punched for the frame, but also a gear, a ratchet wheel, and two other small parts are produced. The work is done on a dieing machine, which operates to the very close limits that are essential in a clock. An additional item of economy is the fact that most of the other parts are made from exactly the same kind and gauge of metal, greatly simplifying purchasing, stockroom management, and production ordering.

Planning such as this is more important than ever today, when metal is scarce, and it is essential to conserve it, as well as lessen costs and speed production.

The metal used is Revere Leaded Brass, supplied to exceptionally close limits as to composition, gauge, temper, flatness, and straightness. Revere takes pride in its ability to meet these strict requirements, and will be glad to collaborate with any manufacturer in working out the application of its metals to modern, simple, accurate, metal-and-money-saving plans and processes.

## REVERE

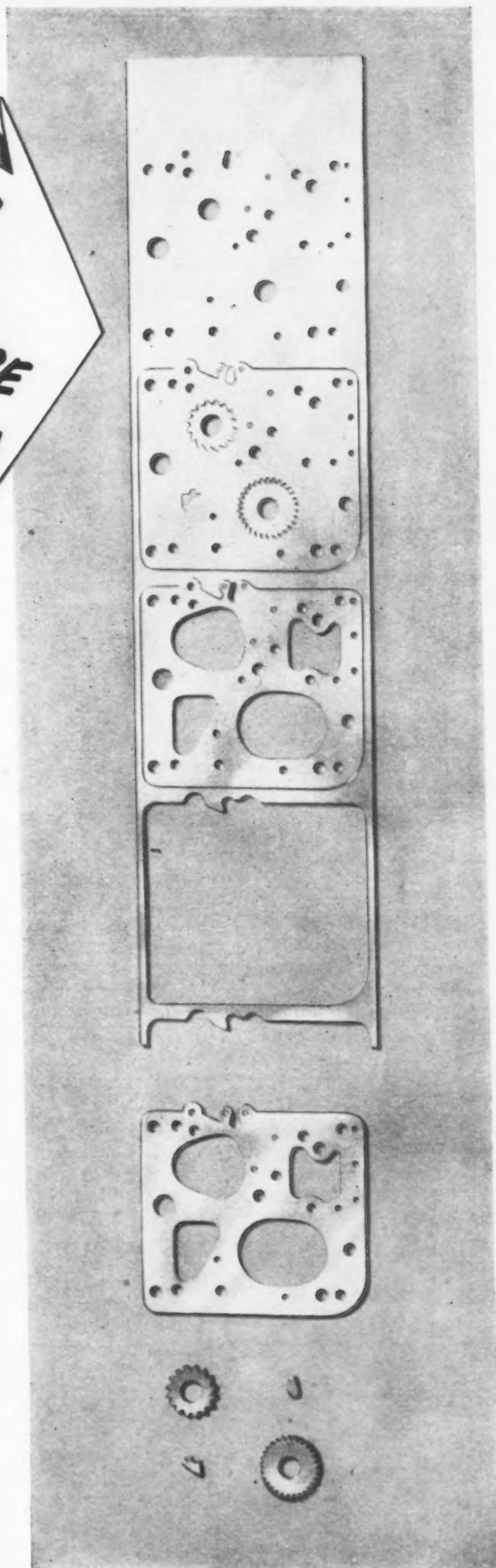
**COPPER AND BRASS INCORPORATED**

*Founded by Paul Revere in 1801*

230 Park Avenue, New York 17, New York

*Mills: Baltimore, Md.; Chicago, Ill.; Detroit, Mich.; New Bedford, Mass.; Rome, N. Y.—Sales Offices in Principal Cities, Distributors Everywhere.*

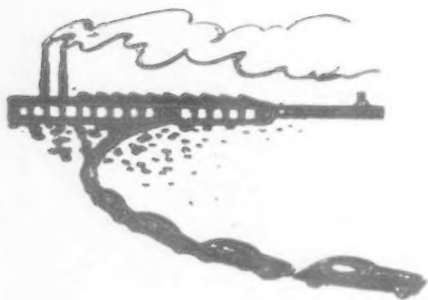
*Progressive steps in the accurate, economical manufacture of clock parts by the William L. Gilbert Clock Co., Winsted, Connecticut.*



# Assembly Line . . .

WALTER G. PATTON

• Ford strike settlement still leaves secondary issue of pensions open . . . Reuther criticizes car price increases . . . Buick automatic transmission is due in 1948.



**D**ETROIT — A compromise was reached last week between the UAW-CIO and Ford Motor Co. on the real issue concerned. The threat of a strike, although not entirely averted, has at least been forced to revolve around the pension plan, which observers here declare is a secondary issue. It is not believed by competent authorities that the remaining differences are important enough to cause a strike.

A four-man board will be set up to negotiate the question of the union's liability to suit for breach of contract under the Taft-Hartley Act. Two members of the board will be chosen by the union and two by the Ford Motor Co. If this committee fails to conclude an agreement within 3 months, the group will choose a fifth member. This arrangement has been accepted by both factions which have also agreed that a time limit of 1 year will be allowed to fully compromise their differences.

Thus start what many observers here believe the preliminaries to the impending testing period by the motor capital of certain aspects of the Taft-Hartley Act. These men point out that it is very possible that before Ford and the UAW have come to final terms on the question of union responsibilities, other cases regarding the same points will have

reached the courts elsewhere, and will therefore point the way for Detroit settlements. The motor city may not be the arena in which management and labor will battle out and clarify their respective positions under the new labor law. It is recalled that the Wagner Act was not entirely cleared up until years after its enactment. Observers here believe the Taft-Hartley Act will also require some time but that labor relations have progressed so fast since the Wagner era that negotiations and agreements will clarify the new labor law in a much shorter time.

Despite the removal of a strike threat the Ford Motor Co. was forced to close its passenger and truck assembly lines on Aug. 6 because of slow starvation caused by the continued Murray strike. Ford's tractor line continued to operate and the company has hopes it will again be able to start production this week.

Chrysler, General Motors and Studebaker have also felt the impact of the parts shortage caused by the Murray Co. troubles, and they had Chrysler's Canadian truck production hanging on the ropes.

Some labor observers here believe that Ford's agreement with the union in regard to further negotiation of the loopholes in the new labor law will be employed in other contracts held by that union. In this way they declare the major auto companies and their suppliers could all continue to operate under temporary agreement. This is necessary if the industry is to function on anything like a normal basis. The one big question which is bothering both the union and the motor companies is that the legal departments are not at all sure that it is practical or even possible to legislate around the law by separate contract agreements. In fact there is plenty of disagreement here by industry and press observers as to whether the agreement reached by Ford and UAW-CIO was to the company's or the union's advantage. When Ford waived its right to sue for the next year they gave up an empty prerogative as very few suits against unions have been entered, although such suits

have been possible in 28 states for some time.

**F**OLLOWING General Motors' raise of car prices Packard, Nash and Kaiser-Frazer came through with similar increases. Walter Reuther, UAW-CIO president, lost no time in blowing his top over the new prices. He said that General Motors could "well afford to offer price reductions several times as great as the price increases which it has now inflicted on the consumer." Mr. Wilson's claim that wage increases made the price advance necessary were categorically denied by Reuther.

Many sources here question the accuracy of Mr. Reuther's statements. Nor could many observers give too much credence to his statements of the exact price cut he recommended, as they are quite sure Mr. Reuther has not been given the opportunity to go over the books, and unless he did they fail to see how he could be so sure of his figures. Part of one of Reuther's points, however, rang true in the minds of some authorities here. In blasting General Motors the labor leader said, "Present wage rates paid by GM were in effect during most of the second quarter for which the company reported an enormous profit." Reuther went on to say that therefore high wages were not a valid reason for the last price hike, and if the new steel price, which he said was "wholly unwarranted," was passed along to the consumer, it would add but \$10 to the retail price of a standard car. Here again the whole question comes back to what constitutes profits and just where the line of demarcation between "decent" and "enormous" profits can be drawn.

**A**LTHOUGH the automatic transmissions have been dropped on the '48 models of the light cars, Buick will definitely come out with a complete automatic transmission in its '48 model. Reliable sources here declare this equipment will be in the process of manufacture by December.

George T. Christopher, presi-



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*at*



**IN CHICAGO AT THE DODGE-CHICAGO PLANT**

**\*ACCURACY HEADQUARTERS**

will be the Pratt & Whitney Booth at the Machine Tool Show. You won't want to miss a long visit at A.H.Q.

You won't be able to miss it—for the P&W Booth will be one of the largest at the show . . . 6000 square feet of floor space crammed with P&W Accuracy at work. Toolroom equipment will include the newest in jig boring practice, surface grinding, gear grinding, thread milling. A whole section will contain P&W Lathes—"the standard by which all fine lathes are judged." Of course the Keller machines will be in full operation—doing everything from small mold and die cavities up to Kellering very large automotive dies. The full line of P&W Die Sinkers will be at work plus an exhibit of die jobs done at savings you can't afford to miss. Here also will be Kellerflex machines and attachments demonstrating the phenomenal cutting abilities of the newest Keller Carbide Burs. You'll find taps, dies, milling cutters, reamers—all the newest cutting tools including carbides. And of course you'll find the latest P&W Gages, engineered into efficient setups for modern quality control or selective assembly.

There, too, you'll meet the men who engineer P&W Accuracy into the tools you use. They'll be available for consultation on your precision problems. And there will be comfortable chairs where you can sit and talk over your shop problems.

We'll be looking for you at A.H.Q. Please feel welcome to come early and often and to stay as long as you can.



Booth No. 55 in the northeast corner

**PRATT & WHITNEY**

*Division Niles-Bement-Pond Company*

**WEST HARTFORD 1, CONNECTICUT**



gent and general manager of the Packard Motor Car Co., said last week that never in the company's history have dealers and the public reacted so favorably as they did to the 1948 Super Eight Convertible car. The chief executive of Packard expressed optimism of car production figures for the balance of the year. He reported that the inability to get steel in quantities sufficient to meet planned production schedules had held Packard's half year volume to 24,053 units, but "that is just about twice as many cars as we shipped in a comparable period a year ago." He also pointed out that production for the second quarter of this year ran 10 pct ahead of 1947's first quarter.

Mr. Christopher disclosed that

July shipments totaled 5609 units, or the best month's production of any so far this year. Financially Packard has also improved its position over that of the first quarter. A second quarter deficit of \$724,461 was only half of the amount lost during the first quarter. For the first 6 months the total loss to the company was \$1,872,634, and Mr. Christopher pointed out that the current 6 months' figures absorbed a tool writeoff of approximately \$1 million greater than in the corresponding period of 1946.

Chevrolet Motor Div. of GM and its dealer organization from coast to coast continue to wage a relentless battle to keep new cars off the so-called black market. T. H. Keating, general sales manager of

Chevrolet, said that "in order to control more closely possible abuses, Chevrolet reinstated in its contract with dealers the prewar bootleg clause, penalizing dealers who sell for resale Chevrolet equipment to anyone but Chevrolet dealers." He pointed out that Chevrolet dealers are just as incensed over abuses in the black market as are the press and the public and that the dealers have gone to extraordinary length to guard against speculators and opportunists. Unfortunately, he continued, the Chevrolet dealer does not exercise control over the vehicle after it has been sold, with the result that avaricious owners sometimes speedily dispose of a new vehicle in the used car markets and pocket a quick profit.

## Problems of Marginal Mines to Get Airing

Washington

• • • The first post-adjournment investigation of the mining industry will get underway in Seattle on Sept. 8 when the Mining Subcommittee of the House Small Business Committee opens hearings on the problems of small and marginal mines.

The committee will look into the mining situation from several angles, one of the most important being to determine whether a permanent premium payment plan is necessary from the standpoint of defense stockpiles.

Mining-state Congressmen, embittered over President Truman's veto of the bill (HR 1602) to subsidize production of copper, lead, zinc and manganese, are laying plans for enactment of similar legislation next year.

The President said that continuation of the subsidy program would have conflicted with the nation's long-run objective of conserving domestic mineral resources. Moreover, he stated the plan provided in the bill would have been too inflexible to meet present needs, and supply with minor exceptions would not have been increased.

The committee will also hold

hearings in Reno, Nev., on Sept. 15 and 16 and in Phoenix, Ariz., on Sept. 29. Other hearings will be held in Denver, Colo., and in Washington, D. C. Interior Secretary Krug and representatives of the Army and Navy will testify at the Washington hearings.

## Scrap Import Duties Returning Next Year

Washington

• • • Import duties on ferrous and nonferrous scrap will again become effective June 30, 1948, under the terms of a bill (HR 4069) signed by President Truman last week.

Tariffs on scrap were suspended as an emergency measure under a wartime statute which became effective March 14, 1942. The suspension was to terminate with the end of the unlimited national emergency proclaimed on May 27, 1941. Congress, however, in the closing days of the session decided to set June 30, 1948 as the date for termination of the suspension.

Unless the suspension is further extended, the old tariffs on scrap will become effective next July 1. The rates on ferrous scrap are 75¢ per ton, plus the following extras for alloy content: an additional duty of \$1 per lb on the vanadium content in excess of one tenth of 1 pct; 72¢ per lb on the tungsten content in excess of two tenths of 1 pct; 65¢ per lb on the molybdenum content in excess of two tenths of 1 pct; and 3¢ per lb on the chromium content in excess of two tenths of 1 pct.

**JUST WHAT YOU'VE ALWAYS WANTED:** Plenty of baggage space is provided in this new Chrysler "Traveler." Attached to a luggage rack on the roof of the car is a water-repellent olive drab canopy which folds over from four sides and is fastened with eight elastic straps with swivel snaps. When not in use, the canopy can be tucked away in a bag in the trunk of the car.







Bumpers and similar parts that require good cold-forming quality in steel are stronger and more economical to produce when made of N-A-X HIGH-TENSILE.

N-A-X HIGH-TENSILE's resistance to deformation (denting) is 60% greater than the denting-resistant quality in carbon steel. Its inherently fine grain and higher hardness provide a better surface texture for plating.

If you have parts requiring a combination of high strength, good formability and better surface texture, it will pay you to investigate N-A-X HIGH-TENSILE steel.

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is synonymous  
with*



# GREAT LAKES STEEL CORPORATION

N-A-X ALLOY DIVISION • DETROIT 18, MICHIGAN • UNIT OF NATIONAL STEEL CORPORATION

THE IRON AGE, August 14, 1947—89

• **Munitions Board stockpile policies due for investigation . . . Stockpiles lack many critical materials . . . Controlling legislation likely to be amended . . . Two new groups study aviation policy**



**W**ASHINGTON — Investigation of the stockpiling policies of the Munitions Board (formerly the ANMB) is in the cards for the next Congressional session. In the rush to adjourn, this problem was cast by the way-side, but legislators who were instrumental in writing the stockpiling law have repeatedly expressed their displeasure over the failure of the board to accumulate any sizable quantities of strategic and critical materials.

While actual tonnage figures on stockpile materials are held in a confidential status, certain congressmen, who have had access to the semiannual reports of the board, have stated that the stockpile is "pitifully low" in regard to some of the most critical mineral and metals. Senator Milliken, R., Colo., for example, has stated that he has been authorized by the board to say: "The tightness of copper, lead, and zinc has precluded any stockpiling of these metals under the act."

Expenditures for stockpiling bear out this gloomy picture. The

original plan for stockpiling under Public Law 520 involved the accumulation of the necessary stockpiles over a period of 5 years beginning with the fiscal year 1947. This would have involved the expenditure of about \$360 million per year. However, Congressional appropriations were not forthcoming in this amount and for the fiscal year just ended the board had only \$100 million available. The board failed to use up even this relatively small amount and on June 30, 1947, still had \$18,895,888.80 for which no commitments had been made.

Since funds authorized for the fiscal year 1947 had not been completely expended or contracted for, and for other reasons, Congress did not grant the full Munitions Board request for \$200 million for stockpiling during the fiscal year which began on July 1. The actual appropriation amounted to \$100 million for stockpile purchases and \$75 million in contract authorizations.

**S**TILL, the board states that it is not anticipated that the cumulative total deliveries as of June 30, 1948 will exceed \$300 million, despite the fact that transfers from surplus property are eventually expected to total about \$275,000,000. Thus, in 2 years it will be possible to have actually accumulated only about one-sixth of the total amount which must be procured.

It is planned to use the new appropriation almost exclusively for those materials which are now most lacking in the stockpiles, since the stockpiles are badly out of balance, primarily as a result of the unbalanced nature of the surpluses. Many of the most deficient materials are also of high dollar value. This means that a balance cannot be achieved with the funds presently available.

It is confidently anticipated, however, that by next July each one of the stockpile materials will be available for at least limited procurement and that by that time procurement at the originally planned rate of between \$300 and \$400 million per year will be entirely feasible.

The primary reason for this failure to accumulate substantial

stockpiles lies in the policy set out by Congress in Section 3 of Public Law 520, the stockpiling act, which directs the board to purchase materials only when such purchases would not disrupt the domestic economy and when such materials are in excess of current industrial demand.

With extreme shortages of copper, lead, zinc, tin, antimony and other strategic materials now facing the country, authors of the legislation realize that board officials in interpreting the above section have necessarily refrained from entering the market. However, the board is also accused of interpreting this section in a very narrow sense.

In any case, it can be expected that Congress will amend this section sometime during the next session, since it is realized that the country has a false feeling of security based on stockpile appropriations in view of the fact that actual tonnages purchased are not made public.

Another provision of law which inhibits stockpile purchases is the "Buy American" clause. In this instance, Congress is not likely to recede, but will probably strengthen this provision, thereby reducing the Munitions Board's authority to purchase certain materials which the United States obtains largely from foreign sources.

**C**ONGRESS is also considerably irritated over the liquidation of RFC stockpiles of certain critical materials, particularly since only limited quantities of such materials found their way into the Munitions Board stockpiles. There is no official connection between the RFC and defense stockpiles, but the board has first call on all RFC materials and did not step in and buy large quantities of RFC copper, lead and other materials because of existing industrial shortages. Some legislators also feel that the board has accepted at face value too much advice from industry in regard to stockpile objectives.

Congressional concern over this problem is further illustrated by the passage of premium payment legislation for copper, lead and zinc, and the addition of manganese





## "GREATEST THING SINCE THE SLAG POT!"

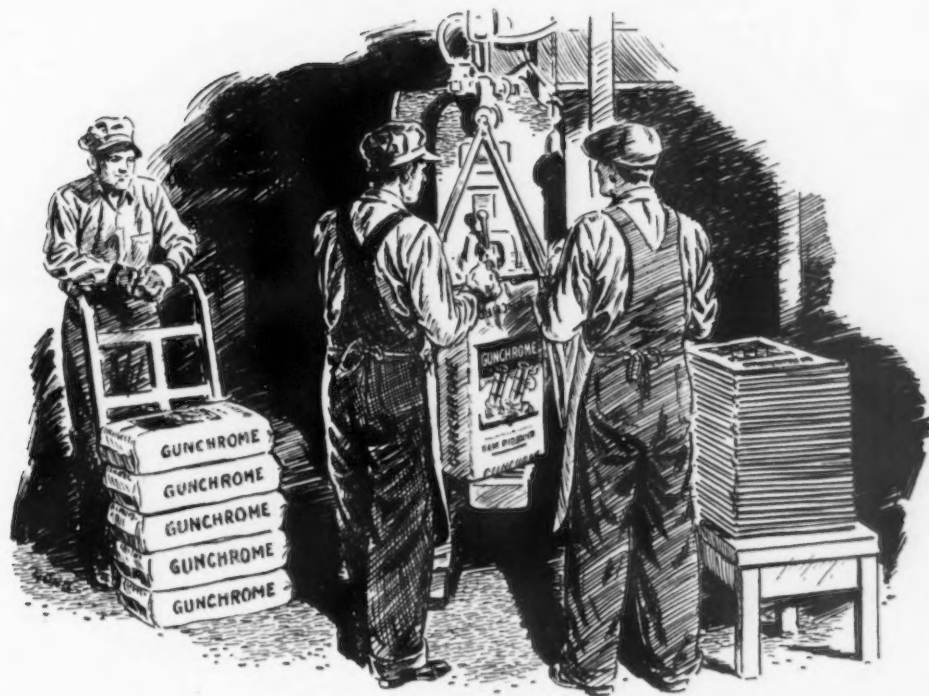


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The new B.R.I. Gun was developed especially to apply Gunchrome and our original basic gun refractory, Gunmix, to vertical and semi-vertical wall structures. The gun replaces these refractories, properly wetted at the point of discharge, at the rate of more than 100 pounds per minute.

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during the hectic sessions prior to adjournment. Apparently the President did not share this concern as evidenced by his veto of the measure.

\* \* \*

If the number of groups looking for a solution to the problems of the tottering domestic aviation industry is any criterion, the industry should be in fine shape sometime during 1948.

State, War, Navy, Commerce and the Air Coordinating Committee have been trying to formulate plans to get the industry out of its post-war doldrums for more than a year. Two new groups have been added to this list within the past month.

Stealing a march on Congress in mid-July, when the legislators were debating the merits of a bill creating a National Aviation Council, President Truman appointed a five-man temporary Air Policy Commission, composed of private citizens, to aid in formulating a national aviation policy. This group has already begun its work and will submit its final recommendations by Jan. 1, 1948. Completely discarding the National Aviation Council, Congress finally came up with a bill establishing a Temporary Congressional Aviation Policy Board, composed of five members of each

House. The President has since approved this measure.

That the aviation industry is in bad shape is an understatement. Compared with a peak monthly wartime average rate of 8000 planes plus, last year the industry turned out approximately 1800 military and civilian transport planes. Money appropriated for plane purchases during the current fiscal year will probably limit military procurement to about 1700 craft, as compared with estimates of from 3000 to 5000 planes annually as the absolute essential for these troubled times.

**I**NDICATIVE of the state of the industry is the fact that the RFC has had to step in with funds to keep a few companies financially sound. Even with a sound policy and stepped-up military procurement, it is estimated that it would take 2 years for the industry to get back to the wartime rate of production.

The answers are not easy. Government subsidies have been ruled out and these new boards have been created in an effort to establish a national policy that would meet the industry's problems in addition to solving the security question.

The commission appointed by Mr.

Truman was directed to study such questions as "the current and future needs of American aviation, including commercial air transportation and the utilization of aircraft by the armed services; the nature, type, and extent of aircraft and air transportation industries that are desirable or essential to our national security and welfare; methods of encouraging needed developments in the aviation and air transportation industry; and improved organization and procedures of the government that will assist it in handling matters efficiently and in the public interest.

The president pointed out, however, that "the final recommendations of the Commission must . . . go beyond the limits of any one phase of aviation. They should be so broad in scope and purpose that they will assist in revising old policies and framing new ones, and will serve as a guide for formulating a carefully considered national air policy."

## Kaiser Buys Sheet Mill

Detroit

• • • Kaiser-Frazer Corp. has purchased the Chapman-Price Steel Co. of Indianapolis, Ind. A former subsidiary of Continental Steel Corp. the Indianapolis mill has a capacity of 55,000 tons annually, or 20 pct of the amount of sheet steel Kaiser-Frazer uses in the current production of its automobiles. Kaiser-Frazer has secured a new source of steel which the management will take over on Oct. 1, thereby, "further strengthening our basic material supply." Continental Steel Corp. will furnish sheet bar to the mill together with the products received from Portsmouth Steel Corp. and outside steel sources will assist the automotive company in achieving its present goal of 2000 cars a day.

## Landing Gear Plant Sold

Washington

• • • Frank P. Gordon, Boston, Mass., will convert a recently purchased government surplus landing gear plant to manufacture of engine parts and pumps and similar items, WAA reports on announcing the sale. Sales price was \$125,000, exclusive of any equipment which the buyer may want to retain.

## THE BULL OF THE WOODS

BY J. R. WILLIAMS





# SHEFFIELD

## MACHINE TOOL DATA

MFG—No. 114

### CUT COSTS OF PROFILING TUNGSTEN CARBIDE TOOLS



Solid tungsten carbide punch and split type die were ground on the Micro-Form Grinder—16 hours for punch and 8 hours each for two die sections.

Die has .0005" taper per inch and clears the straight punch by .0005"—Inspection proved all dimensions were held to better than customers' required tolerance.

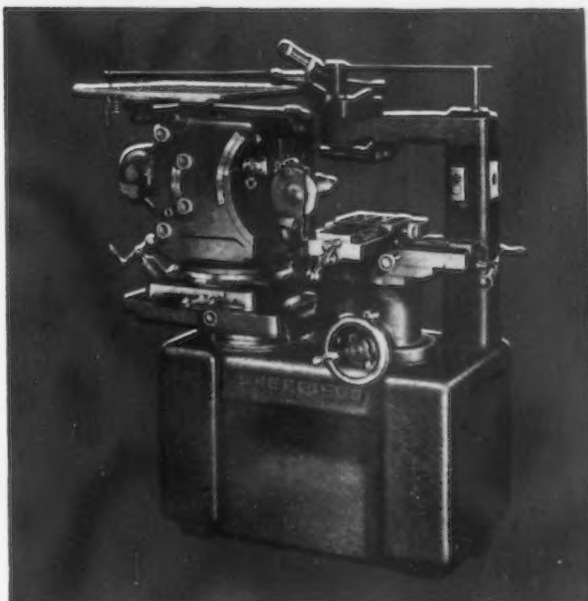
Grinding was performed directly from 50-1 layout made on an engineer's detail glass. Work was ground and checked without being removed from the Micro-Form Grinder.

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• Shareholders of West's largest independent steel fabricator again asked to vote on sale to corporation subsidiary while U. S. Court decides its legality . . . Seattle truck manufacturer launches new mechanical camel.



**L**OS ANGELES — Whether the West's largest independent steel fabricating plants will be allowed to "fall into the hands" of Columbia Steel Co., subsidiary of U. S. Steel Corp., is up to the courts to decide.

However, while the wheels of justice grind slowly and, presumably, finely, stockholders of Consolidated Steel Corp. will have another chance to express their wishes in the matter. These owners of Consolidated had already voted 72 pct of their shares in favor of such a sale early this year.

Now, according to the notice of annual meeting of shareholders, "Because the agreement covering the sale of the corporation's assets has been amended to provide for the postponement of the closing of the transaction for what may possibly prove to be an extended period of time, it is deemed necessary to resolicit new proxies from the shareholders." These proxies will be cast at the annual meeting of Consolidated's shareholders on Aug. 29.

In the notice of the annual meeting released by Consolidated, the history of the transaction between that company and Columbia is set forth at considerable length and in detail.

About the only thinking on the

possible transfer of this company's fabricating plants to the U. S. Steel subsidiary not covered in the report is that of those steel men outside the esoteric fold. Obviously, other independent fabricators in the West are not too happy about the proposed change in ownership and the independent steel producers likewise have lost some sleep over the possible elimination of a good customer for plates and structurals which would get its plates and structural shapes from Geneva and other U. S. Steel Corp. subsidiaries.

Consensus of informed observers is that the sale will ultimately be consummated and that if the Federal District Court of the United States turns thumbs down on such a transaction, the case will be carried directly to the Supreme Court. While no layman dares decide the case on its legal merits, there are many who frankly say that they do not see how the Dept. of Justice can successfully prosecute this suit when the department gave the green light to U. S. Steel for the purchase of the steel plant at Geneva, Utah.

In addition to voting on the general proposal for the sale of their company to Columbia, shareholders of Consolidated will be asked to approve a change in name to Consolidated Liquidating Corp. This is a relatively minor detail required by terms of the sale agreement, but nonetheless it seems to imply the trend.

The present agreement between Consolidated and Columbia provides that if the Dept. of Justice suit is not favorably disposed of prior to Dec. 31, 1948, or if the parties do not agree prior to that date that there is no deterrent to the closing of the transaction, either the buyer (Columbia) or the seller (Consolidated) shall have the right to terminate the agreement of sale, or to extend still further the period therein provided for the occurrence of such events and for the closing of the transaction.

**T**HIS proposed transaction is a major one for the West Coast. Although the money involved is not reminiscent of some wartime spending, it is a considerable sum—\$8,293,319. It is estimated that each shareholder will get about \$40.00 per share for his

stock although there are a few "if's" and "and's" to give an element of speculation to the deal. So far as the stockholder is concerned, it looks as if it were a good deal. In 1929 the high for Consolidated was \$24.00 and the low \$11.50. On Oct. 24, 1946 the range was high \$47.00, low \$34.50. Then the stock was split two for one and between Oct. 25, 1946 and Dec. 16, 1946, the range was from a high of \$20.00 to a low of \$15.75.

In regard to stock values the report to shareholders states: "Before the prospect of the proposed sale of assets became generally known the common shares of the corporation (meaning Consolidated) sold on the Los Angeles Stock Exchange and New York Curb Exchange during the week ended Dec. 14, 1946, at a low price of \$18.00 per share and at a high price of \$19.75 per share. During the period commencing Dec. 17, 1946, and ended Feb. 22, 1947 (which was the day on which it became generally known that the Attorney General had expressed the opinion that the Agreement of Sale was within the condemnation of the Sherman Anti-Trust Act), the highest price at which the common share of the corporation were sold on such exchanges was \$34.87½ per share and the lowest price at which they were sold was \$25.00 per share. During the following period commencing Feb. 23 and ended July 15, 1947, the highest price at which such shares were sold on such exchanges was \$31.00 per share and the lowest price at which they were sold was \$21.50 per share."

It is simple to draw the conclusion that the highest price ever paid for Consolidated stock before it was generally known that the sale to Columbia was in prospect was \$47.00 per share during the month of February 1946 which was equivalent to \$23.50 per share for the present number of outstanding shares. In other words if shareholders get about \$40.00 per share by selling to Columbia, they will have done right well by themselves.

The plants involved in the projected sales to Columbia include: Fabricating units located at Maywood, Vernon, South San Francisco, Berkeley, Fresno and Taft, Calif.; Phoenix, Ariz.; and Orange,



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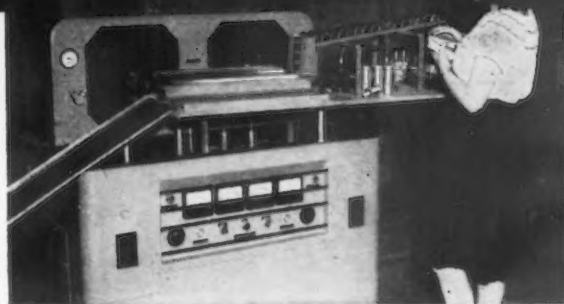
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Tex. Relative sizes of these plants as reported to stockholders are indicated by the number of employees: Maywood, 2425; Vernon, 837; South San Francisco, 825; Berkeley, 171; Fresno, 93; Taft, 65; Phoenix, 109; Orange, 938.

Companies which will lose their independent status if this sale is consummated are: Consolidated Steel Corp.; Western Pipe & Steel Corp.; the Steel Tank & Pipe Co. of Calif.; Consolidated Shipyards, Inc.; and Consolidated Steel Corp. of Texas.

The report to shareholders in regard to the Aug. 29 annual meeting reiterates that there has been no agreement whereby the proposed purchasers (Columbia Steel Co.) will hire any of the officers or directors of Consolidated, but also points out that "it is possible that some of such persons may be retained or employed by the buyer."

Apparently no type has been spared in laying all the cards on the table for the benefit of the shareholder who must decide what is best for him in the event the U. S. courts come to the conclusion that the shareholder has anything to say about what is to happen to his investment.

**SEATTLE**—When the Arabian-American Oil Co. starts on its new pipeline project in Saudi Arabia, custom-built trucks produced by Kenworth Motor Truck Corp., will be responsible for most of the hauling.

This company has contracted for a large fleet of "desert carriers"

and the first of these trucks has withstood rigorous torture tests in the Arizona desert.

The mammoth carriers are designed to operate directly on the hot sands of the Arabian desert and have six powered wheels with the chassis weighing approximately 14 tons. Some of these units will operate with semitrailers and will handle gross loads as high as 50 tons and pay loads of approximately 22½ tons. These are believed to be record loads for cross-country or for cross-desert operations. Low pressure sand-type tires developed by the oil company will be used.

For desert operations the trucks have been equipped with double radiators which carry twice the capacity of the largest commercial trucks manufactured. Hall-Scott 400 engines, manufactured on the West Coast, will provide the power.

This specialized unit is reported to be the forerunner of other custom-built trucks to be produced by Kenworth, according to Mr. Robert O'Brien, sales manager for the trucking division.

There is reason to believe that the pending effective date for implementing the Taft-Hartley Labor Act on Aug. 22 is having its effect on influencing the thinking and planning of local labor unions.

It is apparent that the International offices of the Aero Mechanics Union hope for a settlement between Boeing Aircraft Co. and Local 751 before that time. However, the local union does not

see eye to eye with the International on this.

The Boilermakers Union, AFL, Local 104, is also having its differences with its International leadership. The local group is now drawing up plans for a second court battle to define the rights of a local as opposed to the International organization. The new case, instituted by a union member, will go to court in Seattle on Oct. 23 for the purpose of determining whether an International group has the power and the right to seize control of the local. In a decision of July 24 which reversed an earlier court verdict, the local won the right in the state supreme court to reduce salaries of officers in its own unit. The International had opposed this move.

**SALT LAKE CITY** — A transplanted blast furnace at the Iron-ton plant of Geneva Steel Co. and 500 beehive coke ovens in Carbon County are being offered for sale by War Assets Administration. Sealed bids will be received by the Salt Lake City office until 2 p.m. Sept. 10.

The beehive ovens are currently being used by Utah Fuel Co. under a special lease arrangement, for experimental purposes. The company is running a series of tests designed to furnish more information on the coking qualities of Utah coal.

The blast furnace moved from Joliet, Ill., to Iron-ton during the early phases of the defense program to bolster the far western supply of pig iron while the Geneva plant was being built, turned out to be one of the wartime miscalculations. By the time the furnace was reassembled here the Geneva blast furnaces were completed and it never did get into production.

**DONCASTER FORGE:** The new forge for alloy steel handling at Daniel Doncaster & Sons, Ltd., Sheffield, England features a Wellman manipulator to handle the ingot in the hammer and charge the furnaces. The forge crews welcome the change.

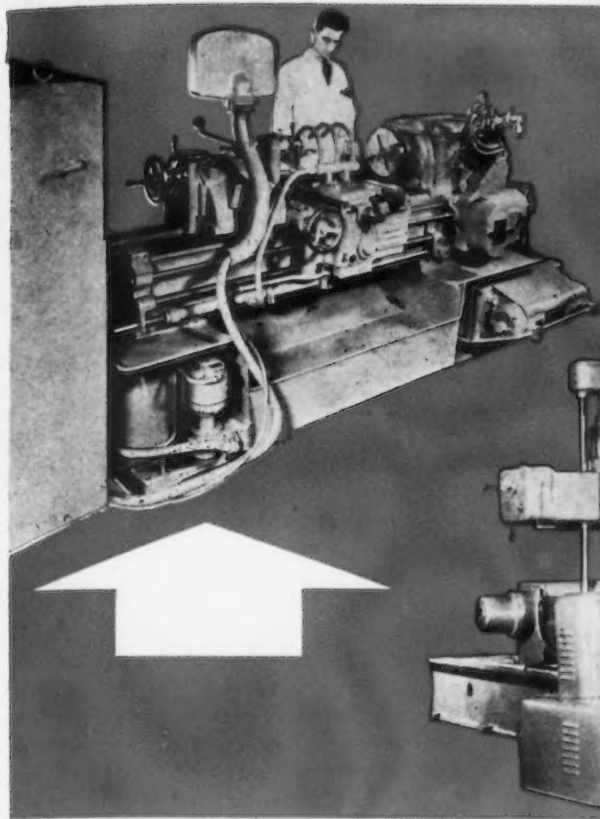


## Freight Car Fee Up

Washington

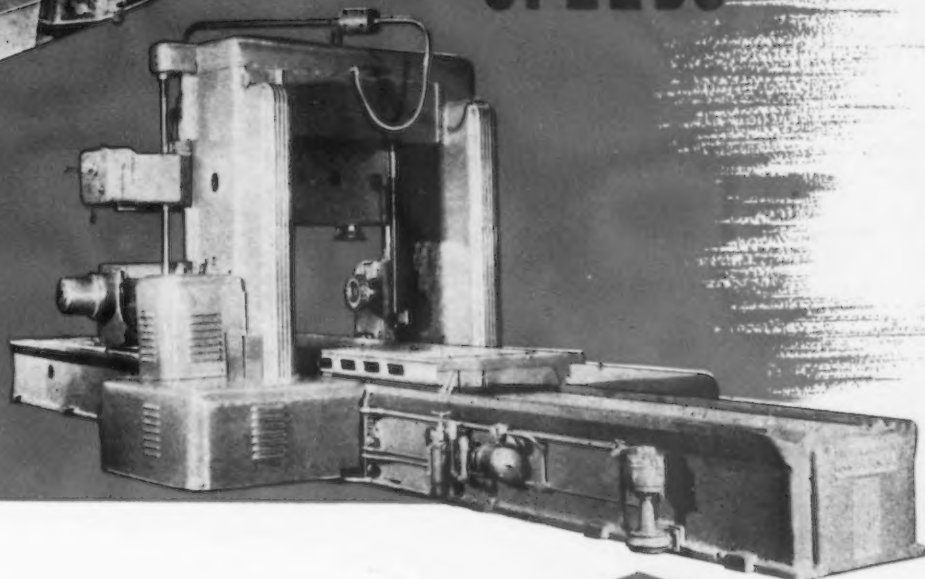
... Attempting to ease the freight car shortage by increasing the availability of cars now in service, the Interstate Commerce Commission last week ordered an increase in the daily rental fee from \$1.25 to \$2.00. The order, effective Oct. 1, does not include tank and refrigerator cars and will expire on March 31, unless further extended or modified.





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Above left is shown a Monarch Magna-Matic Lathe all electrically controlled, equipped with a Model 11022 Short Ruthman Gusher Coolant Pump. To the right is an Ingersoll 48 x 48 x 16' Four Head, Type A 30 Adjustable Rail Milling Machine, equipped with a 11022-E, 1/2 HP Ruthman Gusher Coolant Pump.

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# European Letter . . .

• **Economic collapse may dictate decision of British to withdraw from Ruhr . . . Unified administration including Western Germany in its framework only hope of restoring European prosperity.**



**L**ONDON — Two conferences are now to consider the future of Germany — an Anglo-American conference on coal production in the Ruhr opening in Washington next week, and a tripartite conference between Britain, France and the United States to take place at a later date and designed to secure agreement, if possible, on the vexed problem of the level of German industry.

French protests at the fixing of a new level of industry for the Ruhr are the cause of this second conference, for it is realized that the Marshall Plan can hardly succeed if France disputes the place of Germany in it. The Washington Conference, however, faces the more immediate problem—the restoration of productivity in the Ruhr.

The most recent bulletin issued by the British element in the Control Commission paints a dark picture of the British Zone. The rise in coal production has come to a standstill at about 219,000 tons a day, the steel figure is still well below 3 million tons a year, the food position is no better, the transport system is so much worse that without emergency measures more coal could not be handled if it were raised.

All are agreed — British and American alike—that the present stagnation presages a winter of collapse, and that under these condi-

tions, far from there being a German contribution to a revived Europe, the ruin and misery in Germany will continue to drag the Continent down.

The British Government has therefore agreed to send a delegation to Washington to discuss the central issue in the Ruhr—coal production—even though the Americans are unwilling to consider wider bizonal issues such as food deliveries which the British not unreasonably believe to be inseparable from the problem of coal output.

The fact that in recent weeks a series of American experts have visited the British Zone and brought uniformly critical reports back to Washington has not increased British anxiety to be summoned to Washington and put on the mat.

**N**OR is this the only reason for British hesitation. Criticism of British management — of poor discipline in the pits, of confused lines of authority and lack of clear decisions in the administrative hierarchy — is only half the picture. Most of the American reports insist on the positive demand for new incentives to production in the Ruhr and new outlay to make them effective.

For instance, it has already been agreed that some foreign exchange earned by coal exports shall be reserved for purchasing consumer

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goods for the miners and that the percentage shall increase with each rise in exports, that each miner reaching his production target shall be rewarded with a food parcel equal to 40,000 calories, and that all previous incentives in food, tobacco and Schnaps shall be fully honored. For the general consumer, Mr. Anderson, the American Minister of Agriculture, has promised guaranteed imports of 300,000 tons of grain a month, and since the aim is to raise the ration to 2000 calories a day as soon as possible, the imports figure might well increase.

Other suggestions include the import of foreign coal to provide stockpiles for next winter, an emergency program for transport, and even

the import of some steel. From all these proposals, one conclusion is already obvious. They must add enormously to the costs of occupation.

**A**T THIS point, the British government must ask itself and its American colleagues some very searching questions. That a severe economic crisis will overtake this country before the year is out no one now denies. The first problem today is not to incur more commitments, but to reduce those that exist. The cost of maintaining the British Zone last year amounted to over £118 million, the cost of the Army of Occupation to £84 million. The estimate for the current year is not so heavy, but military and civil costs together will hardly be less than £100 million.

But the actual figures in sterling do not reveal the full gravity of the situation. A fair percentage of the outlay has had to be disbursed in dollars. Food can only be bought in hard currency and, under the Anglo-American agreement on the fusion of the two zones, the British undertake to shoulder 50 pct of the trading deficit, largely in dollars, and over the next 3 years to provide £125 million in capital investment, also partly in dollars. No figures have been published of the extent of the drain on Britain's supplies of dollars, but it is known to be large and is likely to be larger in the coming year.

But how, in fact, can these commitments be reduced? Already voices have been raised in this country suggesting that nothing short of a complete British withdrawal from Germany is sufficient to meet the British crisis. Speaking in Sussex recently, Mr. Douglas Jay, the Labor MP, said, more graphically than grammatically: "We shall have to present America with the dilemma of actually paying the costs themselves or [the British], evacuating and leaving them, or the Russians if you like, to take over the Zone."

And Mr. Jay is not alone. A growing body of opinion sees salvation in a ruthless reduction of foreign commitments—military and civil — and Germany, involving



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great expenditure under both heads, inevitably stands high on the list.

Yet a moment's reflection must show that the international repercussions of so desperate an act as a British withdrawal would be quite disastrous. In the United States, a likely reaction would be a decisive strengthening of that body of opinion which already regards Europe as a finished continent and further American aid as good money thrown after bad.

The chance of piloting a Marshall Plan through Congress would be greatly diminished, possibly destroyed. A very possible consequence might be a decision by the American Congress to throw in its hand, abandon the American Zone and leave Europe to go to perdition in its own way. And the mere possibility of such an outcome would undermine the whole political balances of Europe. The Germans in the West are already uncertain and perturbed by a (wholly unjustified) fear of an Anglo-American withdrawal from Berlin. Any hint of the British leaving the Ruhr would create a mood little short of panic from which only the Communists could profit.

Most serious of all, the suggestion of a Western withdrawal

would lead to a decisive reorientation in French policy. In France, fear of Germany is still dominant. If the possibility arose of the Western Powers abandoning their control, the French government, whatever its political color, would turn to Russia for reinsurance.

If the choice is forced upon the British of deciding whether to maintain and even increase their present commitments or to withdraw altogether, they may not in another 6 months be free to choose. Economic collapse may dictate their decision. This is the dilemma which exists quite apart from any questions of British preference or inclination; and it is this dilemma which the Washington Conference on increasing German productivity should be compelled to face.

ANY unbiased examination of the dilemma will show, however, that it is to a large extent unreal. The British and the Americans are not compelled to consider only two alternatives—total British cooperation or total British withdrawal. To argue so would be the equivalent of arguing during the war that since Britain and America were involved in the same operation, they should contribute precisely equal

shares. Then it was recognized that each nation should contribute to the extent of its power and resources.

Today, if the fact is accepted that the restoration of Germany in a wider European framework is a joint enterprise of importance almost equal to the winning of the war, common sense alone dictates that the same effective and rational methods of pooling should again be employed.

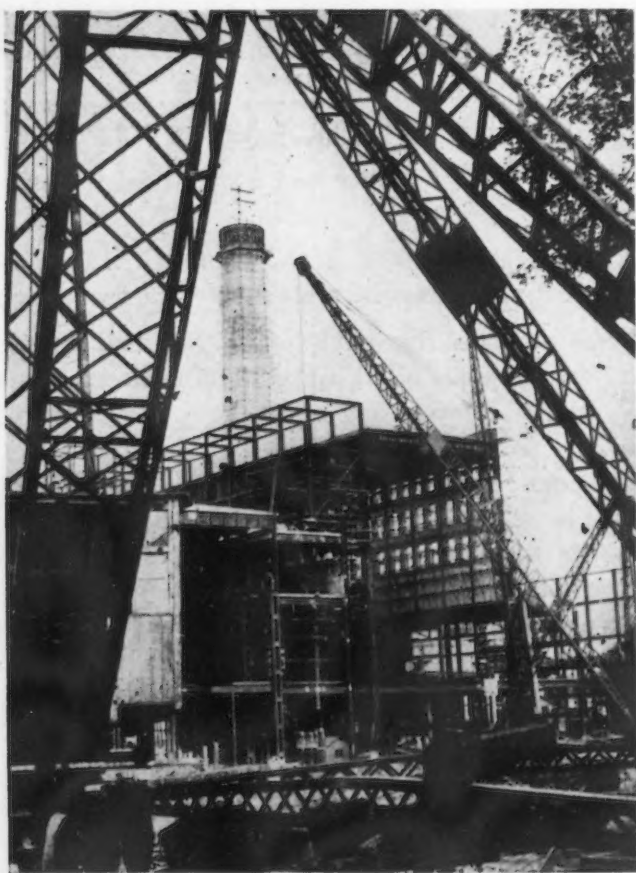
The Americans are insistent—rightly—that the Western Zones of Germany should be included in the Plan. But their inclusion involves not only the contribution Germany could make to European revival. It also involves the question of how much the British and the French as occupying powers and as good Europeans could make to the revival of Western Germany without endangering their own recovery.

Contributions in dollars would clearly be ruled out, but not necessarily in raw materials, in administrative and managerial manpower, or in grants made in sterling or francs. Once their contribution had been assessed, then would be the time to determine what American figure would be necessary to fill in the deficit between the needs of Germany—and its occupying powers — and the contribution each could make. Such an estimate would certainly be larger than the American contribution made now (on the basis of parity with Britain), but it would be very much smaller than the American expenditure which might follow on a British or French collapse.

This, then, is the only realistic framework for the Three-Power Conference on Germany promised by Mr. Marshall. Only in this way can the German problem be genuinely brought into the orbit of the Marshall Plan.

WHAT in practical terms would such an approach entail? The first point should be a redrafting of the financial commitments involved in the occupation of Germany. Hitherto only an Anglo-American agreement has existed. It would need to be extended to include the French Zone and its basic principle would be the lessening of the economic burden on the two weaker partners. But obviously such a policy would work more efficiently and productively if it were

(CONTINUED ON PAGE 144)



POWER DEVELOPMENT: To overcome the shortage of installed electric capacity in England, a \$300 million 2 year expansion program is under way. This new powerhouse is located outside London at Kingston-on-Thames.



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**COPPERWELD STEEL COMPANY**  
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• **Robert A. Gillies** has been appointed vice-president in charge of all manufacturing of the Steel Co. of Canada, Ltd., with headquarters in Hamilton, Ont. He joined the Steel Co. of Canada in 1928 at Hamilton as superintendent of blast furnaces and prior to his appointment as vice-president has successively held the positions of assistant works manager and works manager of the Hamilton works.

• **J. J. Reagan** has been appointed manager of sales of the Pittsburgh district sales office of American Steel & Wire Co., succeeding **Frank J. Marmion**, deceased. **S. M. Parks** succeeds Mr. Reagan as assistant manager of sales in the Pittsburgh office of this U. S. Steel subsidiary. Mr. Reagan was associated with the Carbon Steel Co. of Pittsburgh and L. Goldsmit Co. before joining American Steel & Wire Co. in 1920 as a clerk in the purchasing department at Pittsburgh. Three years later he was transferred to the sales department in Pittsburgh as a price clerk. Except for a brief period in the New York sales office, he has been located in Pittsburgh in various capacities. He was appointed assistant manager of sales in 1934. Mr. Parks' experience with American Steel & Wire Co. dates back to 1942, when he started as a correspondent in the priorities division of the Pittsburgh sales office. He has been a salesman since 1945.

• **Charles D. Mills** has been appointed assistant to manager of operations, Pittsburgh district of U. S. Steel's Carnegie-Illinois Steel Corp. Mr. Mills started with U. S. Steel in 1919 in the engineering department of New Castle works. He was transferred to Pittsburgh general offices in 1932 as specialty engineer and in 1941 was made manager, raw materials, fuel and power division, Pittsburgh district, the position he held at the time of his present appointment.

• **Otto E. Hagemeyer** has been appointed statistician and sales analyst for Tucker Corp., Chicago. He has been employed in the automotive field for more than 25 years.

## PERSONALS

• • •

• **Hickman Price, Jr.** has been appointed executive vice-president of Kaiser-Frazer Export Corp., Willow Run, Mich. Mr. Price was formerly with the government as an official of the Foreign Economic Administration.



**R. L. PUETTE**, vice-president in charge of production, Clark Controller Co.

• **R. L. Puette** has been elected vice-president in charge of production, Clark Controller Co., Cleveland. Mr. Puette has spent the major part of his business career with Clark, starting in 1930, and has been manager of the application engineering department, assistant sales manager, sales manager and works manager.

• **Wells N. Thompson**, vice-president of the H. K. Ferguson Co., of Cleveland, New York and Houston, has been appointed project director in charge of constructing and equipping the first peacetime atomic pile at Brookhaven National Laboratory. Mr. Thompson has been a member of the Ferguson organization for more than 25 years, and until his appointment to direct the company's activities in the atomic energy program, he was in charge of the firm's eastern district. He also headed up the Ferguson export division which is operating in several foreign countries.

• **Arthur R. Kinney** has been appointed director of purchases of the Wickwire Spencer Steel Div. of the Colorado Fuel & Iron Corp., with headquarters in Buffalo. He joined Wickwire 3 years ago as assistant purchasing agent and previously was assistant director of purchases in New York for the Texas Co. Mr. Kinney succeeds **William T. Stratton**, who resigned to become vice-president of the Red Ash Pocahontas Coal Co., Cincinnati.

• **Frederick H. Eaton** has been appointed assistant vice-president of American Car & Foundry Export Co., New York. He had previously been connected with ACF as assistant to the vice-president in the New York sales office. Mr. Eaton has relinquished his former assignment in order to concentrate his efforts in the foreign field.

• **L. B. Chapman**, formerly connected with the American Car & Foundry Co.'s Marine Div., has been appointed assistant manager, valve division, in the New York sales office. **H. P. Ackerman**, formerly assistant manager of sales promotion in the eastern states, has been appointed general sales representative of the valve division.

• **E. B. Brant** has been appointed district sales manager of the Page Steel & Wire Div. of American Chain & Cable Co., Inc., succeeding **Fred H. Jones**, who has retired because of ill health, after many years of service with the company. Mr. Brant has been with the Page Steel & Wire Div. in Detroit. Prior to that he was at the Page plant at Monessen. He will make his headquarters at the Pittsburgh office.

• **H. D. Stark**, formerly general superintendent of the Pittsburgh works, has been appointed assistant general manager of manufacturing operations of Jones & Laughlin Steel Corp., Pittsburgh. **A. T. Lawson**, formerly chief industrial engineer of the corporation, has been appointed general superintendent of the Pittsburgh works. **W. L. Witnev**, formerly the assistant chief industrial engineer of the corporation, has been appointed chief industrial engineer.





**B. C. GOULD**, executive vice-president, Murray Corp. of America.

• **B. C. Gould**, formerly vice-president in charge of operations of the Murray Corp. of America, Detroit, has been elected executive vice-president.

• **Henry C. Forster**, formerly purchasing agent for Ekco Products Co., Chicago, has been appointed to the new post of merchandise manager for the company, and **John L. Moore**, formerly manager of Ekco's Byesville, Ohio plant, has been named purchasing agent. Mr. Moore, who has been with Ekco for 25 years, was superintendent of the Chicago plant prior to managing the Byesville factory which Ekco acquired last year. Mr. Forster, before joining Ekco, was manager of the housewares division of Montgomery Ward & Co.

• **Boyd V. Giesey**, formerly senior design engineer for Taylor-Winfield Corp. and for the last 2 years in charge of the flash welder division of Progressive Welder Co., Detroit, has been named to head all sales of Progressive Welder Co. resistance welding equipment in the state of Michigan north of Detroit. Mr. Giesey is opening new offices in Lansing, Mich. He will be assisted in the new operation by **Robert O. Wight**, formerly welding applications engineer for Progressive Welder.

• **Edgar Andrews** has been named sales engineer of the Brown Instrument Co. in Atlanta; **Nilsson S. Bassett**, at Boston; **R. J. Bierman** and **Clarence W. Swanson**, Minneapolis; **Edward J. Bryne**, Houston; **Warren H. Erftenbeck**, Buffalo; **David J. Fair**, Dallas; **William R. Hamaker**, Detroit; **Lawrence W. King**, New York; **John F. Smith**, Tulsa, and **Andrew H. Albee**, Cleveland.

• **Henry E. Kerley** has been appointed assistant chief engineer, in charge of the Pittsburgh engineering department of McNally Pittsburg Mfg. Corp. He joined McNally Pittsburg as an apprentice draftsman in 1934 at the main office in Pittsburg, Kan. After being promoted successively to design engineer and section chief, he was transferred to Pittsburg in that capacity in 1945.

• **William C. Krecklow**, who started with Allis-Chalmers Mfg. Co. in 1910 as an office boy, has been named production control manager of the company's West Allis, Wis. general machinery works. He succeeds **Harold A. Wallace**, who has resigned. In his more than 30 years with Allis-Chalmers, Mr. Krecklow has successively been a flour milling draftsman, motor winder, switchboard and switch gear foreman, assistant superintendent, superintendent of production schedules and of the electrical manufacturing division. He is succeeded as electrical manufacturing division superintendent by **Arthur A. Ryan**, who has been serving as general foreman in the company's electrical shops.

• **Joseph A. Bogan** has been appointed business assistant on the staff of Bituminous Coal Research, Inc., Pittsburgh. Mr. Bogan comes to the national research agency from Carnegie-Illinois Steel Corp.

• **Morris F. Jacobs** has been appointed Wisconsin representative for Illinois Testing Laboratories, Inc., Chicago.

• **Earl Stiefel** has been appointed director of purchases of the Moore Div., Conlon-Moore Corp., Joliet, Ill. Mr. Stiefel was formerly purchasing agent of the Round Oak Stove Co.



**RANDOLPH W. HYDE**, treasurer, Carnegie-Illinois Steel Corp.

• **Randolph W. Hyde** has been elected treasurer of Carnegie-Illinois Steel Corp., Pittsburgh, succeeding **Leon F. Payne**, deceased. Starting with Carnegie Steel as an office boy in 1922, Mr. Hyde's entire business career has been with the company. Through progressive promotions, he has held the positions of clerk, credit representative, assistant credit manager, credit manager and assistant treasurer, central area.

• **L. R. McAfee** has been named district manager in Dayton, Ohio, of the Peninsular Steel Co. He replaces **Lee Dallas**, who has resigned.

• **Earl W. Mahaney**, former metallurgist for Youngstown Sheet & Tube Co., Youngstown, has been appointed assistant general superintendent of the company's strip and tinplate division at Indiana Harbor, Ind. Mr. Mahaney joined Youngstown Sheet & Tube Co. in 1936 as a metallurgical observer. After considerable experience in the Campbell laboratory, bloomer, seamless tube and openhearth departments, he was transferred to the company's Brier Hill works at Youngstown and later appointed a metallurgist. Last year he was transferred to general offices as an associate of Dr. Karl Fetters, special metallurgist.

• **J. R. B. Freeman** has been appointed district manager for Bethlehem Supply Co. of California in the San Francisco area. Mr. Freeman was formerly refinery sales representative for Bethlehem Supply. **R. B. Trimble** will assume Mr. Freeman's activities under the direction of H. E. Chapman in refinery sales; **R. A. Casson** will take over Mr. Trimble's work in the sale of sucker rods and wire ropes.

• **M. P. Cortilet**, formerly assistant manager of sales for American Can Co.'s central division, has been appointed the division's manager of sales, succeeding **H. A. Pinney**, who has been made assistant to the vice-president. Mr. Pinney, who has been with the company since its organization, will assist Mr. Kellogg in the overall direction of the division, which is the company's largest operation. Mr. Cortilet has held various positions in the sales department during the past 26 years. He was first employed by a subsidiary which made shrapnel during World War I, joining the can company itself a year later in 1917.

• **Richard E. Krafve** has been named assistant to the director of purchases of Ford Motor Co., Dearborn, Mich.

• **Larry H. Coffin** has returned to Akron, Ohio, as assistant to George K. Hinshaw, vice-president and production manager of Goodyear Tire & Rubber Co.'s foreign operations. Mr. Coffin has been plant manager of the company's tire, textile and mechanical goods operations in Sao Paulo, Brazil, since 1942. **Marvin A. Ryan**, who has been in charge of Goodyear's Cuba plant, succeeds Mr. Coffin as plant manager in Brazil. **Robert R. Boyle** has been named division superintendent of Goodyear Tire & Rubber Co.'s tire plant in Buitenzorg, Java. Mr. Boyle joined Goodyear in Akron in 1933, starting on the production training squadron. During the war he was associated with Goodyear Aircraft Corp., returning in 1945 to Goodyear Tire as a tire division foreman.

• **Willard C. Gulick**, with the B. F. Goodrich Co., Akron, Ohio, since 1926, has been named president of International B. F. Goodrich Co. Mr. Gulick, who has been general sales manager of the company's export division, succeeds **Stanley W. Caywood**, who has retired. The new B. F. Goodrich executive represented his company overseas for 12 years before the outbreak of World War II.

• **Willis A. Erickson** has been appointed plant manager of the La Consolidada steel plant at Piedras Negras, Coahuila, Mexico. Mr. Erickson was formerly openhearth superintendent at the Lakeside plant, Jones & Laughlin Steel Corp., at Cleveland.

• **C. F. Breer** has been appointed sales manager of McCulloch Motors Corp., Los Angeles. He has been assistant sales manager of the company for the past year. Before joining McCulloch Motors, he was a naval officer attached to the Bureau of Aeronautics, and prior to the war was with the engineering division of Chrysler Corp. in Detroit.

• **Dr. D. Leigh Fowler, Jr.** has been appointed manager of the patent department of the Research & Development Div. of Pittsburgh Consolidation Coal Co., Library, Pa. Dr. Fowler served 1 year as a research chemist for American Cyanamid, followed by 6 years in the patent department of Nash-Kelvinator. For the past 5 years he has been with Corning Glass Works, where he became manager of the patent department. **Gerard C. Gambs** has been appointed manager of the service department of the Research & Development Div. of Pittsburgh Consolidation Coal Co. Mr. Gambs was employed by Pittsburgh Coal Co. as a junior mining engineer until his entry into military service in 1942. During the past year he served as assistant professor at the engineering experiment station of Ohio State University. Mr. Gambs will also serve as a coal mining engineering consultant to the projects of the Research & Development Div.

• **A. L. Sonnhalter**, for 15 years vice-president in charge of the Pittsburgh Crucible Div. of Crucible Steel Co. of America at Midland, Pa., has resigned because of ill health. Mr. Sonnhalter will continue as a director of the company, and will serve as adviser and consultant to the management. He has been elected president of the Midland Water Co., a subsidiary of Crucible Steel. He joined Crucible Steel in 1922 as superintendent of the Midland works openhearth department. He became superintendent of the Midland steel works in 1924; assistant general superintendent of the entire Midland works in 1926, and general superintendent in 1928. In 1932, Mr. Sonnhalter was elected vice-president and took charge of the Pittsburgh Crucible Div., embracing the Midland district operations of Crucible Steel.

## OBITUARY...

• **T. Scott Clingan**, 72, who retired Jan. 1 as vice-president in charge of steel plant operations for Bethlehem Pacific Coast Steel Corp. with headquarters in South San Francisco, died of a heart attack July 28.

• **Crawford N. Kirkpatrick**, 57, chairman of the board of the Landis Machine Co., Inc., of Waynesboro, Pa., died July 28 after an illness of several months. His entire working life of 34 years was spent with the Landis Machine Co.

• **Lester O. Stearns**, 53, residential division sales manager of York-Shipley, Inc., York, Pa., died of a heart attack Aug. 1.

• **Harry W. Sprague**, 75, vice-president of the Wollaston Foundry, Quincy, Mass., with whom he was associated 50 years, died July 30.

• **Walter L. Fugh**, secretary and treasurer of the Simonds Gear & Mfg. Co., Pittsburgh, died July 28.

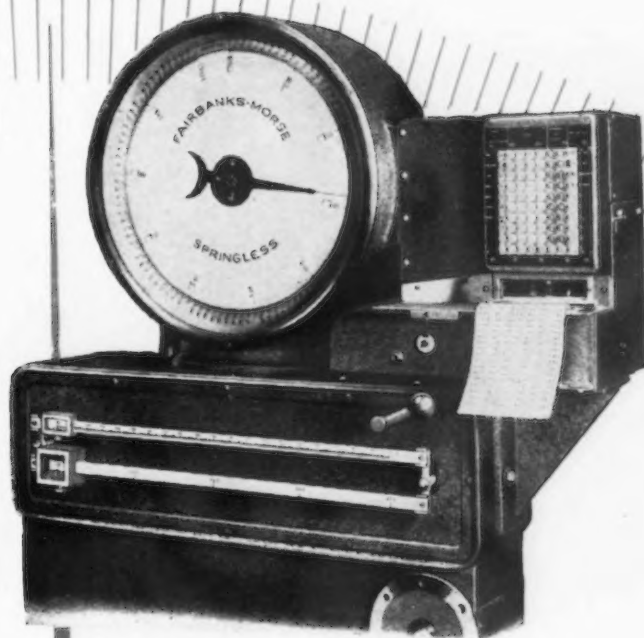
• **Felix A. Kummer**, an experimental engineer for Packard Motor Car Co., Detroit, died recently.





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*A name worth remembering*



# Industrial News Summary...

- **Scrap Breaks First Time in 3 Months**
- **Dual Sheet Steel Prices May Go Soon**
- **Mills Report Demand Continues Strong**

**F**OR the first time in almost 3 months the price of heavy melting steel scrap broke in the nation's three major markets, Pittsburgh, Philadelphia and Chicago. The declines were not large, but the apparent end of a rising trend led steelmakers to breathe a sigh of relief. Except for a break extending from the middle of March to late May, this was the first time since the end of OPA that zooming scrap prices have been definitely turned downward.

Present steel prices are not on a firm foundation. They are geared to current high output and current wage levels but they could not long have withstood scrap prices well over \$40. Steelmakers see no signs of a serious drop in the operating rate for the balance of this year; authoritative sources say that steel labor rates are frozen at their present levels for some time to come and can only go up if they move at all. Hence the indication that scrap prices may be leveling off is good news to an industry whose third quarter profits would have been seriously threatened if the recent scrap price spiral had not been interrupted.

The decline in the price of heavy melting steel at Pittsburgh averaged \$1.25; at Chicago, \$1.50; and at Philadelphia, \$1. This sent THE IRON AGE steel scrap composite, which is the average of heavy melting steel delivered prices at those centers, down \$1.25 for the week to \$40.42. Heavy melting grades declined at Cleveland and Youngstown by averages of \$1.75 and \$2.75 respectively. The steel scrap market has not as yet been fully tested because most of the largest buyers had not come into the market early this week. But the prospects of cutting scrap prices down somewhat from the fantastic levels they reached in recent weeks gives steel producers hope that present steel price levels can be maintained.

**T**HE steel industry, like other durable goods producers, has been engaged in "overtaking" production. That is, it is supplying current demand plus accumulated, or pent-up demand. That this condition is not at all certain to last throughout 1948 is admitted in most quarters.

Many consumers are therefore looking for a steel price cut should demand slacken at that time. This has happened in the past but it may not happen again. There would be no advantage to be gained by wrecking the price structure in order to fill up steel mill schedules with cheap business. With wages inelastic and raw material costs on a higher plane, with steel companies still showing a relatively poor return on their investment, it is not at all certain that history will repeat itself in this respect.

In the same vein, steel producers are talking about the probability of the return of some companies to eastern areas when the market again becomes competitive. The producers involved are those who have recently withdrawn from eastern

markets in order to centralize their distribution within the more economical freight rate areas.

To date—and this has confounded most of the industry's sagest observers—there is no apparent letup in steel demand at the mill level. However, reports of sales of alloy and stainless steels are dependent on the producers; some say it is off; others report alloy and stainless demand is pushing their operations close to capacity. One company indicated surprise at the increase in alloy business which it hadn't realized was available, especially for gears and bearing steels. Alloy plate demand is still strong too, and while the alloy and stainless demand may be tied up with carbon steel sales, nevertheless it is there.

**T**HE dual pricing of some steel products continues this week. It is known, however, that some producers who are quoting higher prices than the U. S. Steel Corp. are carefully watching for the first move toward downward revision. As soon as one or two companies break the ice on these products, notably enameling sheets, galvanized sheets and long ternes, the rest are expected to fall into line.

News from the high councils of the British Labor Party that the nationalization of the steel industry in that country is to be postponed for the duration of the present economic crisis will come as a welcome relief to industry leaders in that country. It is hardly expected to produce any more steel to relieve the existing shortage.

Operating heads have been straining themselves for the past 2 years to show that they were capable of producing all that the country needed, just to prevent the socialization of the industry. It appears that for once, if possibly only temporarily, the capitalists have made some new converts. Should the House of Lords object when the issue again comes up, there will probably be no nationalization before 1950.

The steel ingot rate was off half a point this week to 94 pct of rated capacity from last week's revised rate of 94.5. The slight decline is not considered a reflection of demand but is due mainly to the difficulty of maintaining high operations in hot weather. An increase in the price of foundry pig iron at Philadelphia sent THE IRON AGE pig iron composite price up 14¢ to a figure of \$36.52.

Some of the independent steel export houses are concerned over the new ruling requiring individual fourth quarter export licenses for many steel products. This is believed to be a little politics coupled with an Office of International Trade attempt to make some order out of the chaotic steel export picture. Companies which have been doing a legitimate and traditional business are not expected to be affected except for the additional paper work involved.



• **FACTORY WAGES**—Factory workers attained a new high in wages during June, reaching \$1.22 an hr average for all industries while weekly earnings averaged \$48.91, an increase of 5 pct since the first of the year. Pay of durable goods workers was highest, \$52.39 weekly, as against \$45.08 for those employed in nondurable manufactures, according to preliminary estimates by the BLS. Revised figures for May showed that the average weekly earnings for that month were \$48.46, about \$1 above the wartime peak wage average.

• **FREIGHT CAR OUTPUT**—The upward trend in freight car production continued in July when deliveries totaled 5879, as compared with 5514 in June, the American Railway Car Institute announced. Of the July total, the car-building industry produced 4846 cars and railroad shops 1033. The backlog of cars on order and undelivered was 117,592 as of Aug. 1. Of these 87,518 are on order with the car builders and 30,074 in railroad shops. New orders were placed during July for 14,865 freight cars; 12,840 with the car builders and 2025 to be built in railroad shops.

• **RESTRICTED HARDENABILITY**—Carnegie-Illinois Steel Corp. has announced that it is now prepared to meet the demand for hot-rolled alloy steel bars with hardenability characteristics more restricted than standard specifications. Carnegie will work to  $\frac{3}{4}$  of the band width of any of the published bands of the standard H steels. Restriction may be specified three ways: the lower  $\frac{3}{4}$  of the present band, the upper  $\frac{3}{4}$  of the present band width, or the minimum and maximum hardenability can be specified so that the steel is furnished to the middle  $\frac{3}{4}$  of present bands. This specification will entail a price extra amounting to 10 pct of the regular grade extra for the standard H steels. If the grade extra is, for instance, 90¢ the charge for restricted hardenability would cost another 9¢ per lb.

• **OBJECTION**—Secretary of State George C. Marshall has been requested by the Chicago Assn. of Commerce and Industry and the Export Managers Club of Chicago to protest against pending legislation in Cuba. A new law, if passed there, would drastically curtail the right of foreign corporations to change their sales representatives or distributors in Cuba. Violations of the proposed law would be punishable by absolute prohibition of future sales, importation or manufacture of the product of the exporters involved.

• **MANUFACTURING VOLUME**—While only a slight drop in manufacturing—some \$175 million, to a total of \$13.7 billion—was reflected by the dollar volume of sales, shifting currents of demand were beginning to be felt in various industries during May, according to the Bureau of Foreign and Domestic Commerce. Sales of durable goods during the fifth month were set at \$6.2 billion and nondurables at \$7.5 billion. The small decline in shipments was led by the automotive industry; in contrast, deliveries of machinery and transportation equipment (other than automobiles) edged upward during the month.

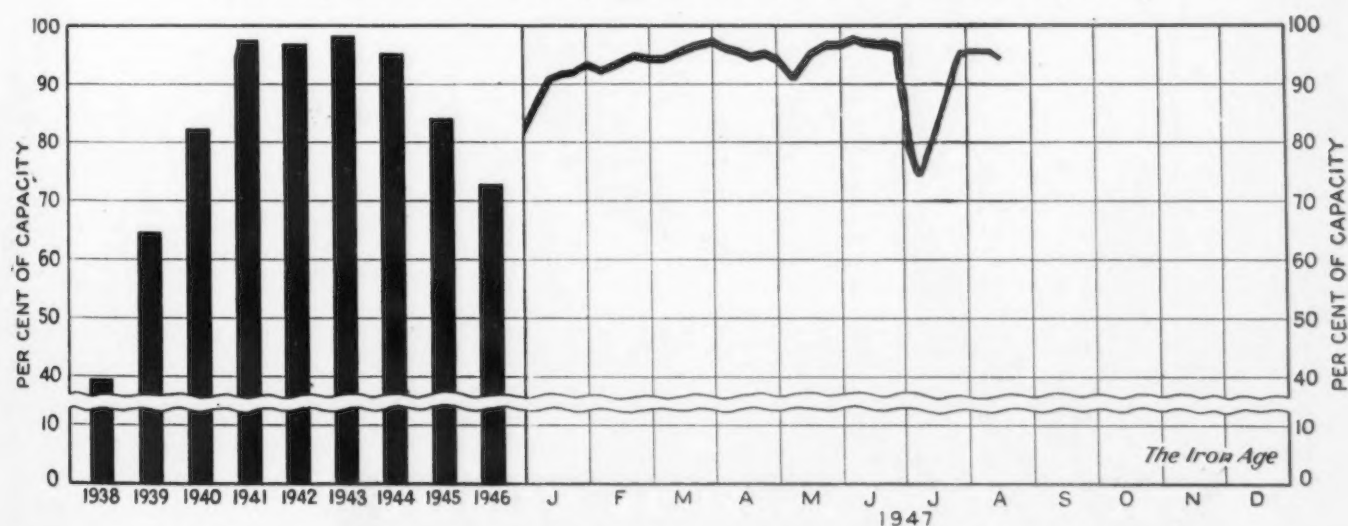
• **SWISS IMPORTS**—Following last year's record when Switzerland was lucky enough to import a record total of 570,000 metric tons of steel products, imports this year are reported to be running even higher. Main suppliers are Belgium, Luxemburg, the United States, and Great Britain. Most conservation controls on steel have been lifted, but rigid scrap controls remain. Since the beginning of the war, 900,000 metric tons of scrap have been collected, permitting production in small openhearth or electric furnaces which furnishes about a third of the annual requirements.

• **LADIES' DAY**—Women now outnumber men as stockholders in many important American corporations, according to the Chicago Association of Commerce and Industry. Last year for the first time, women holding shares of Standard Oil Co. of Indiana showed numerical superiority. Conditions are similar in the case of Swift & Co. and International Harvester. The weaker sex has advanced its position in the last 10 yr in their holdings of U. S. Steel Corp. stock. Women increased from 88,000 to 103,735, while men declined from 102,000 to 92,407. Two reasons have been advanced for this trend: women live longer, more of the feminine sex are working than ever before and are investing their surplus in stocks and bonds.

• **SPIEGEL PRICE INCREASE**—All producers of spiegeleisen increased their prices by \$3 per ton last week. This means a further cost increase to steelmakers and foundry operators.

• **BOLT, NUT PRICES FIRM**—Despite advances in their raw materials costs, bolt, nut, rivet and set screw manufacturers will not raise their prices until the fourth quarter. General increases may be expected on Oct. 1.

Steel Ingot Production by Districts and Per Cent of Capacity



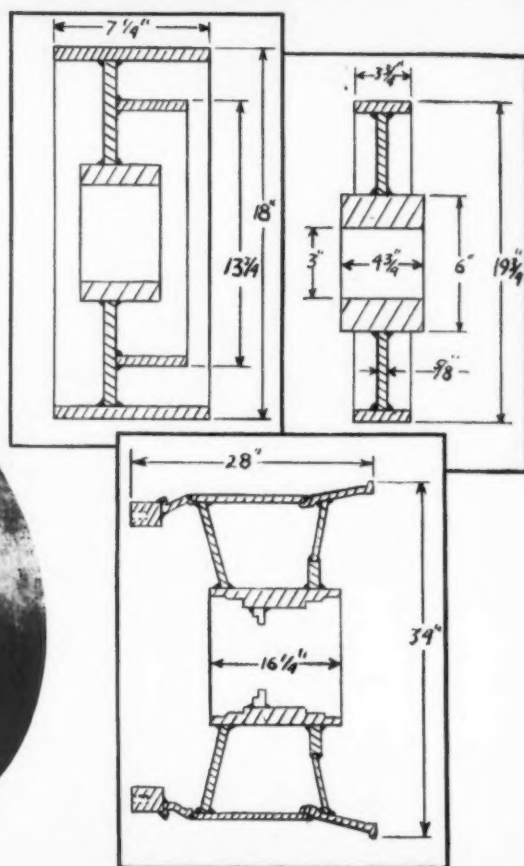
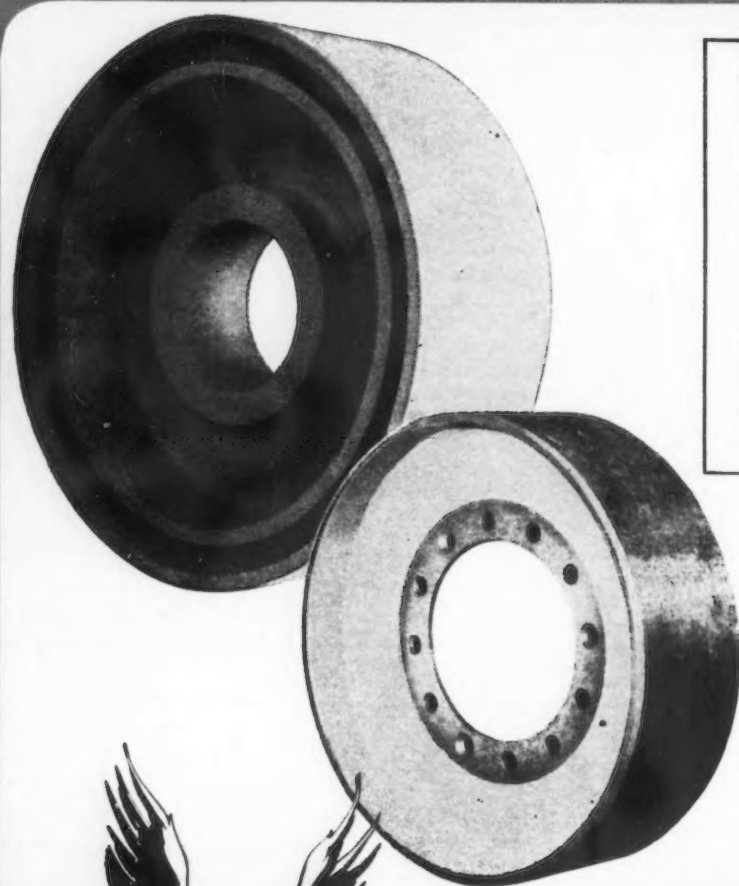
Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
August 5	100.5*	95.0	89.5	95.0	94.5	102.0	90.0	99.0	98.5*	100.5	95.5	84.5	94.0	94.5*
August 12	100.0	94.0	89.5	95.0	89.0	102.0	85.0	99.0	100.5	106.0	96.5	84.4	94.0	94.0

\* Revised.

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## Current Earnings and Higher Prices Leave Steelmen Gloomy

### New York

• • • Behind all the fanfare covering reasons for the recent steel price increases lies a more simple explanation. Present steel earnings are not—according to those who know—on a firm foundation. It is for that reason alone that steelmen get the jitters when wages go up, scrap stays high in price and raw material prices soar.

One of the main reasons why earnings figures do not look like poorhouse reports is because of the sustained demand and high operating rate, according to most steel people. It has been years since low operations prevailed and price cutting was widespread in order to keep plants going. But the fear of that era making its reappearance is a constant nightmare to those who must explain to stockholders why the steel industry rates so far down the line on the basis of return on investment.

Years ago the breakeven point in steel was down around 48 pct of capacity. No one knows exactly what it is now. But a general estimate is that it approaches 75 pct of capacity. Long before that rate is reached the downspiral in net income will have become accelerated if the component parts of steel costs stay where they are.

There is no chance of labor rates being reduced. Authoritative sources say that the steel wage rates are now frozen at present levels and can only go higher if they move at all. Nor is there anyone who will venture a guess that scrap will go down to levels around \$15 or \$16 a ton for a long time if at all.

All this adds up to the dilemma: What can steel firms do when business falls off, the rate declines and cutthroat competition sets in? One important official in the industry swears that there will never again be any special prices or secret rebates. He claims that once a price is given it will go to all consumers. This will mean that no advantage can be gained by any steel company in cutting the price of steel in order

### Daily Nightmare Is What Will Happen When Demand Falls Off and Output Drops

By TOM CAMPBELL  
News-Markets Editor

to fill up available rolling mill space. In the price war of 1937-38 it took only a few hours before every steel firm in the business knew about cut prices—then every one met the lower prices.

With no advantage to be gained by wrecking the price structure in order to fill up schedules with business that won't pay the cost of steelmaking it may be, according to some observers, that an expected decline in steel prices

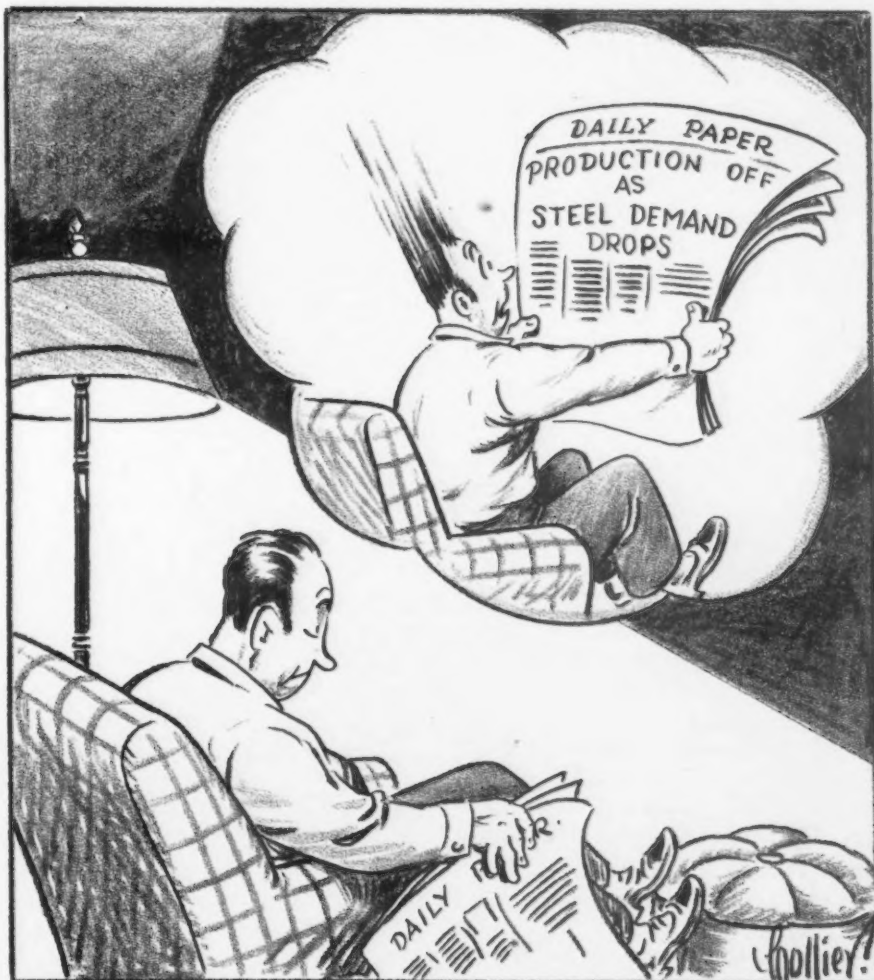
may not materialize in 1948. It has been assumed by many outside interests such as brokerage houses and investment firms that there will naturally be a severe drop in steel quotations when demand falls off. The only reason offered is because it has happened in the past.

Some steel heads questioned privately on this subject see present times far different from before the war. With wages inelastic, with raw material costs on a definitely higher level in conjunction with the higher national income and with the industry making a relatively poor return on investment even in a good year it is not certain that history will repeat itself.

Other steel people privately say that if present steel prices are too high then the price level under severe competition and lower de-

(CONTINUED ON PAGE 146)

### Steelman's Nightmare



## Oglebay Norton to Build Taconite Beneficiation Plant

### Cleveland

• • • Reserve Mining Co., managed by Oglebay Norton & Co., is planning to build a beneficiation plant capable of producing 2,500,000 tons of taconite concentrate annually, on the Mesabi Range, along the shore of Lake Superior.

A company spokesman said Oglebay Norton & Co. may eventually expand the plant, which will be a one-unit operation, to four units, or a 10,000,000-ton plant. Cost of the plant will be about \$15 per annual ton of output.

Plans for construction of the first unit are practically completed, but construction will require 4 or 5 years, largely because of the difficulties in obtaining equipment.

While a number of details remain to be settled, Oglebay Norton officials hint that construction of the plant could start as soon as iron ore consumers indicate the need for greater tonnages than the open pit mines can provide.

Construction of the 2,500,000-ton unit will include a power plant, a railroad, a crushing plant, mill and agglomerating plant, cooling pits, oil storage tanks, harbor, and docking facilities.

About 25 years ago, a large concentration plant was constructed at Babbitt, on the eastern end of the Mesabi Range, to produce magnetic taconite concentrate. The plant operated for about 3 years and produced about 150,000 tons of high grade sintered taconite concentrate.

At the time the plant was in operation, it could not meet the competition of high grade, direct shipping ores. The operation did, however, demonstrate conclusively that, when needed, high grade ore could be produced from this material in large quantities.

One expert has said that as long as less expensive open pit ores are available, production of taconite and any large tonnage of underground ore from the Mesabi Range on privately financed and operated plants and mines is uneconomical.

Later studies, however, suggest

### May Extend Plant Eventually For 10 Million Tons Of Concentrates Yearly

By BILL LLOYD  
Cleveland Regional Editor

that, excluding the capital interest, it will be possible to produce concentrate at a unit cost approximately the cost of underground ore. On the basis of unit value, taconite concentrate will rate 62 + pct iron, compared with direct shipping ores at 51.50 pct iron. But on a ton-for-ton basis, the industry, which will some day turn the Mesabi Range into a manufacturing district, cannot compete with the present open pit ore, which means ultimately higher priced steel.

According to reports, Reserve Mining Co.'s plant will be located north of Beaver Bay on Lake Superior. When the plant is in operation, taconite will be fed directly from railroad car to primary crusher, which will handle pieces up to 4½ ft in diameter. Material will then pass through additional secondary crushers into rod mills, over magnetic separators, wash boxes, classifiers; then to ball mills, classifiers, magnetic separators, wash boxes, surge tanks, filters and then to the agglomeration plant.

Since it requires about 3 tons of taconite to produce 1 ton of concentrate, disposal of the tailings, which have as yet no known commercial value, will be deposited in the lake.

Taconite concentrate plants require much water and electricity. Present estimates are that each ton of concentrate produced requires 40 tons of water and 70 kw per ton of sinter, or agglomerated material.

An Oglebay Norton & Co. spokesman said there is some economy in a two-unit plant, because a plant of this size requires 1800 to 2000 employees compared with 1200 for a single unit. Limit-

ing factor in the proportions of beneficiation plants, apart from everything else, is the size of the crusher.

Range power companies may expand their present output, but the iron ore companies might be required to build their own power plants, feeding them with coal brought up the lakes on return trips.

Surveys indicate that reserves of open pit direct shipping ore will be pretty well depleted in the Mesabi Range in about 19 years, or about 1966, based on a rate of consumption considerably lower than the present 7 million tons a month. Discovery of new deposits or extensions of existing deposits may lengthen the life of the big pits somewhat, but indications are that taconite concentrate will be coming in by the early 50's.

Based on the projections of

### Boom Town, 1952

• • • Pictorial flow sheet, right, for a possible taconite beneficiation plant in the Lake Superior district. Its annual output would be about 2.5 million tons of taconite concentrate. Construction plans include a crushing plant, mill and agglomerating plant, oil storage tanks, a power plant, harbor and docking facilities, not to mention a railroad.

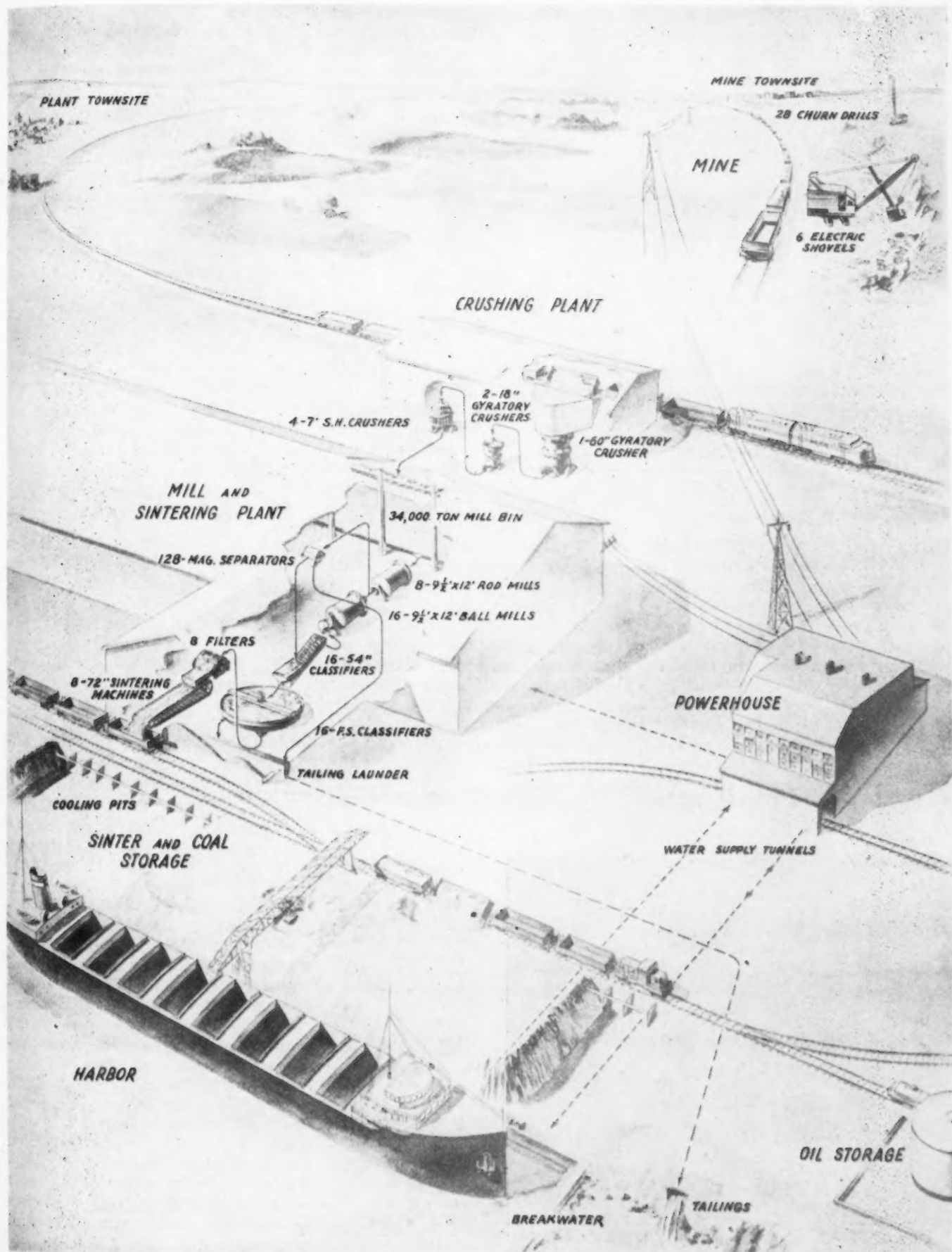
Oglebay Norton & Co., 4 million tons of beneficiated taconite, or concentrate, should be coming down the lakes in 1953; 5 million tons in 1954, and by 1964 it is estimated that 19 million tons should be taking up the slack in high grade open pit ore reserves.

While the final concentrate will be practically all finer than 100 mesh, about one-third or one-half of the crude can be rejected as low grade tailing at comparatively coarse sizes, reducing the bulk of the material to be ground fine and concentrated.

In general, methods for concentrating the taconites that are high in magnetite are simple and well



# Flow Chart for Big Taconite Beneficiation Plant



worked out for commercial plant operations, but the metallurgical problems of the concentration of the oxidized taconites are more complex. Battelle Memorial Institute, Columbus, Ohio, is currently working on this project.

A number of beneficiation plants have been built to serve Minnesota iron ranges containing, principally, low grade hematite iron ores. In 1947, there were 47 such plants which include washing, crushing, screening and jigging. In 1946 these plants handled a little less than 12 million tons, or approximately 23 pct of the total shipment from Minnesota. None of these plants, however, was operating on taconite ores.

Earlier this year (January), Pickands, Mather & Co. announced plans for the construction during 1947, for operation beginning some time during 1948,

of a preliminary pilot type plant for the concentration of taconite, through Erie Mining Co., which Pickands Mather manages. This plant will be designed to treat approximately 1800 long tons of material per 24-hr day involving an annual production of 175,000 tons of finished concentrate and the mining of up to 600,000 tons of taconite per year. Except for the fact that primary crushers will not be installed, the equipment in this plant will generally be the same size and character as contemplated for a full-size commercial plant.

At approximately the same time, Oliver Iron Mining Co., U. S. Steel Corp. subsidiary, announced a program of research construction and expansion in the field of iron ore beneficiation entailing an expenditure of more than \$34 million in the next 6 years. R. T. Elstad, president, Oliver Iron Min-

ing Co., said then that \$2 million would be spent this year in the construction of two beneficiating plants. Included in the plans are construction of four additional beneficiating plants of varying size and capacity to be located at various points on the Mesabi Range.

Well aware that the Mesabi may be a manufacturing district in the not too distant future, the Lake Superior iron ore industry has a sure and quiet answer to the iron ore problem, which has vacillated between a dilemma and a crisis, in the public mind, since the early days of World War II.

Cost of the Mesabi's transformation may easily total \$500 million. Raising this sum may pose something of a problem even for the iron ore industry, whose aloof independence and freedom from government financing and dabbling are unsurpassed.

## Lone Star Pig Iron Due By Middle of September

Daingerfield, Tex.

• • • Lone Star Steel Co., which is operating on a lease from the government with an option to buy, will start the production of basic pig iron by mid-September. The plant is using coal from Oklahoma, both low and high volatile, and from these coals has achieved the proper blend for good metallurgical coke. Most of the pig iron produced will be sold in and

around Texas, although considerable pig iron will be marketed in the Birmingham area.

The full production of the furnace is 1200 net tons of basic iron a day and as soon as sufficient coke stockpiles are achieved, melting operations at Daingerfield will be started on this basis. The housing program has the first call on iron produced from this furnace, but any iron produced over and above that required for the housing effort will be sold on the open market.

As yet, Lone Star Steel Co. has

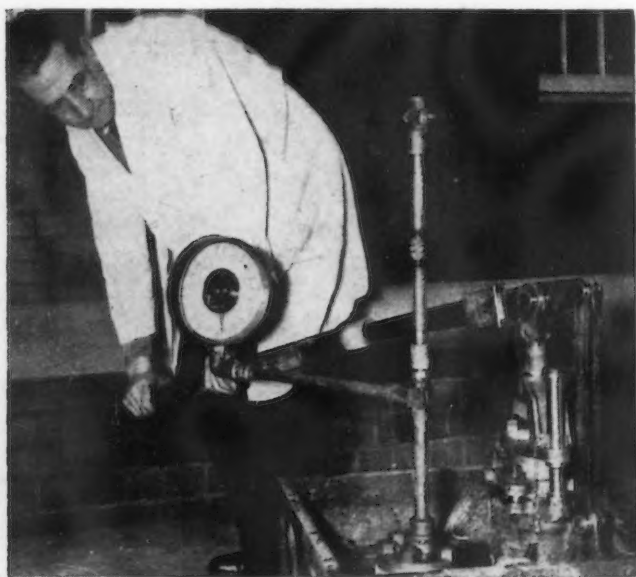
not been able to arrive at a price on the pig iron made in that district because of the recent increases in coal costs and the fact that as yet their production costs cannot be ascertained. Some of the blowing engines at the Daingerfield blast furnace are used by the Navy for wind tunnel experiments. Lone Star has worked out a satisfactory schedule with the Navy whereby it will have the necessary blowing engine capacity to operate the furnace on full wind.

## Tin Solder Control On Short List Lifted

Washington

• • • Effective August 5, amendment of the tin conservation order M-43 by the Commerce Dept. lifted restrictions on tin, content of solder for a list of specified refrigeration and motor uses. It also permits production and unlimited use of tin tetrachloride from low-grade drosses, and scrap metal.

Solder of unlimited tin content, as against limitation to 50 pct content, may now be used on railroad car and truck refrigeration, refrigeration equipment inside refrigerated compartments, aircraft motors, electric traction motors for railroads, streetcars and buses.



• • •  
**THREADLESS JOINT:** An Australian inventor has produced a coupling for tubes and pipes which requires no threads. Under hydraulic test at the University of Sidney, at 1000 lb of water pressure, water leaked from every joint under test except the new type.  
• • •



## Sees Building Activity Continuing in 1947 Despite Rising Costs

Washington

••• Present strong construction activity will continue at or slightly above present levels for the remainder of 1947, despite rising costs for both labor and materials, it is forecast by the Dept. of Commerce, in releasing its revised estimate of 1947 building activity.

New estimates at the end of the first half indicate that about \$12.2 billion of new construction will have been put into place during the year. This is in line with first quarter estimates but represents a \$2.5 billion drop below the more optimistic \$15 billion forecast at the beginning of 1947.

Approximately \$4.5 billion of the estimated building will go into residential types, Commerce estimates, while about \$3.8 billion will be invested in industrial construction and \$450 million farm building. Public utilities, including railroads, have scheduled about \$1.3 billion worth.

At the same time, the department said July new construction was estimated at \$1.3 billion, about 8 pct above June and 16 pct above the same month in 1946, bringing the 7-month total to nearly \$6.5 billion. This represents \$1.7 billion more than for the first 7 months 1946.

Despite the fact that expected dollar volume of construction for 1947 is likely to surpass any previous year, except 1942, a sour note is injected when physical volume is considered. This is expected to be less than two thirds that of the peak year of 1927 and only from 5 to 10 pct above 1939 levels.

The small increase in physical volume as contrasted to the record-breaking dollar volume is directly attributable to the increased cost of labor and materials, the latter, for instance, ranging from 66 to 232 pct above 1939 prices. Construction costs as a whole, however, seem to be leveling off at about 90 pct above 1939, according to the department.

At the half-way mark, a total of 358,000 starts were made for permanent type homes, an increase of 20,000 over 1946; the number of completions amounted to 363,000.

For the whole year, the depart-

ment estimated 725,000 starts against 775,000 completions. Some 350,000 of the latter, however, will represent carryovers from 1946.

Dollar volume of private residential construction is expected to total about \$4.2 billion worth of construction with public funds anticipated at about \$200 million.

Starts are expected on about \$1.7 worth of private industrial construction.

## Conference Board Has Complete Survey On Pay Differentials

New York

••• An advisory committee composed of eminent consulting chemists, chemical engineers, heads of professional societies, leading industrialists and editors has just been announced for the 21st Chemical Industries Exposition which will be held in Grand Central Palace, Dec. 1 to 6. The exposition will have the benefit of counsel of the following widely-known personnel:

Raymond F. Bacon, consulting chemist; Wallace Cohoe, president, The Chemists' Club; Hugh Craig, editor, "Oil, Paint & Drug Reporter"; J. V. N. Dorr, president, The Dorr Company; J. E. Ferris, president, Salesmen's Association of American Chemical Industry; George W. Heise, president, The Electrochemical Society; Sydney D. Kirkpatrick, editor, "Chemical Engineering";

Walter J. Murphy, editor, "Industrial and Engineering Chemistry"; W. Albert Noyes, president, American Chemical Society; W. T. Read, General Staff, War Department; Charles F. Roth, manager, exposition; E. K. Stevens, associate manager, exposition; Charles M. A. Stine, president, American Institute of Chemical Engineers; Robert L. Taylor, editor, "Chemical Industries"; R. Gordon Walker, vice-president, Oliver United Filters, Inc., and E. R. Weidlein, director, Mellon Institute.

Plans for the exposition are progressing at a rate which indicates that every inch of space available for exhibition purposes on four floors of the Palace will be occupied with displays.

General arrangements and management of the exposition are in the hands of the International Exposition Company with permanent headquarters in Grand Central Palace.

## Assembly Plant for Sale

Washington

••• WAA has offered for sale or lease the Kenmore, N. Y., aircraft assembly plant operated during the war by Curtiss-Wright Corp. On a land site of 23 acres are six buildings, with rail and Lake Erie harbor facilities at hand. The main structure is steel frame with brick and asbestos walls, containing 340,000 sq ft of space.

COLOGNE  
BRIDGE: Although a detailed plan has been drawn up for the rebuilding of the German city on the Rhine, the only extensive progress to date has been on the construction of a suspension bridge over the river. It is hoped that the bridge may be completed this year.



## Kaiser Demands New Investigation; Makes Promise On Fontana

Washington

• • • Steel demand and requirements are increasing rather than diminishing, Henry J. Kaiser told a press conference here on Monday and failure to take action to meet these future needs is just inviting a depression. Unless capacity is increased, he added, present prosperity will recede to some prewar point.

Mr. Kaiser said he is urging a thorough investigation by Congress of the steel situation and had placed the request with a number of Senators, including Senators Martin, Cain, O'Mahoney and Murray and believed he had gotten a "half-promise."

At least four government agencies had made steel studies, he stated, but were withholding them. He identified these as the Commerce, Justice and Labor Depts. and the FTC. It was in hope that these reports would be forced out that he was asking for the investigation, he said, and the true steel situation would be revealed.

The steel industry and the American Iron and Steel Institute in particular shortsightedly was failing to prepare for the future increased demand by refusing to expand capacity, according to Mr. Kaiser. The answer to new uses for steel and lower prices is increased production, he said.

"In my humble opinion, the steel industry is afraid that they will have more production than they can sell at some indefinite time,"

he replied to a question by THE IRON AGE as to why he thought the industry was reluctant to expand. "Therefore they don't believe they want to put their money into it. As for me, I am not afraid."

Kaiser plans to expand Fontana should he get his RFC loan adjusted, he said. As soon as Fontana is on a remunerative basis he plans to place it in the hands of the employees and customers.

He also announced that Presidential Assistant John R. Steel-

man had promised governmental help in getting more scrap available to the industry—lack of which is one of the reasons advanced by the industry for present production difficulties.

This is largely to be accomplished through acceleration of the shipbreaking program, he went on. One method of accomplishment would be to urge the Joint Chiefs of Staff to make immediate determination of a number of ships to be scrapped and offer them for sale competitively.

## Heavy Scrap Breaks \$1; No Major Down Trend In Prices Seen Yet

Pittsburgh

• • • The purchase of more than 10,000 tons of heavy melting scrap in Pittsburgh last week broke the scrap price here by \$1 a ton, reversing the upward trend in prices that started during the last week of May. There has been considerable speculation concerning scrap prices during the past 2 months, but no one has been able to reverse the trend.

Current indications are that scrap has reached a peak, but the break this week in prices does not necessarily mean it is the beginning of any major downward trend. The question of supply and demand still holds, and the supply is not yet great enough to sharply reduce prices. It is the belief of top observers in the industry that prices may settle down to around \$40 a ton, but not go much below except on occasional spot sales.

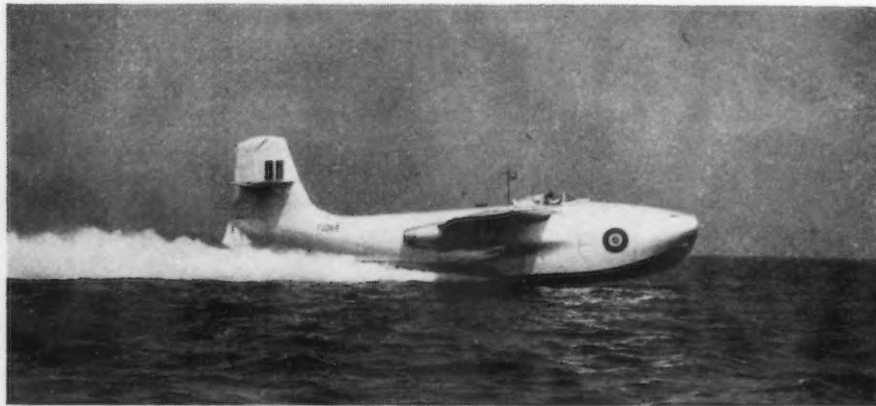
While scrap prices have met strong consumer resistance, mill inventories are not what might be termed heavy. With the coming winter months not far ahead, mills should be laying up stocks of scrap. Actually, inventories are running about 30 to 40 days supply.

A price break in scrap is a welcome relief to mills and foundries, even though it has been only mill grades that have eased. On the other hand, other grades usually follow the pattern of heavy melting scrap so some easing in foundry grades might be forthcoming. As soon as the market weakness was spotted, several mills that had been consistently buying immediately withdrew from the market hoping the lack of interest would further weaken the price.

The break in Eastern scrap prices only brings them more into line with prices in the Pittsburgh consuming district. Scrap selling at a high of \$37 a ton in New York (brokers buying price late last week) means a delivered Pittsburgh price of about \$45 a ton. Actually the price of local scrap here has been about \$43 a ton at the top, so that the \$45 scrap from the East has been somewhat out of line. Consequently, the break in Eastern markets is not incompatible with prices in Pittsburgh which have broken only \$1 a ton.

There is optimism on the part of consumers that the present weakness in the market is a sign of a general recession in scrap prices. To many observers this seems improbable. Supply is not sufficient to enable mills to build up winter stocks and still have enough left over requirements to cause a price break.

**JETS DID IT:** This is the world's first jet propelled flying boat fighter, the Saunders-Roe A-1, which has successfully passed its flight tests at Cowes, Isle of Wight. It is powered by twin Metropolitan Vickers "Beryl" jets. Propeller size has heretofore precluded design of flying boat fighters.





## Major Stumbling Blocks Seen for Argentine Steel Industry

### Washington

• • • While the creation of a basic iron and steel industry in Argentina is still a major ambition of the Peron government, realization of this goal is still a long way off, despite the recent approval by the Argentine Congress of the legislation creating an "Argentine Mixed Steel-Making Corp."

Major stumbling blocks are the lack of accessible domestic resources of both iron ore and fuel. There is now one small charcoal blast furnace in operation in Argentina, which has made only modest quantities of high cost pig iron, and there are several electric furnaces operating chiefly on the basis of imported pig iron and remelting local scrap. The output of all these facilities is small and is wholly inadequate to supply local needs.

Expropriation powers, subsidies, high tariffs, and all other niceties associated with government-controlled industries are included in the legislation creating the "Argentine Mixed Steel-Making Corp.," according to information received through diplomatic channels.

Initially, the plan calls for the production of 315,000 tons of ingot steel annually which would be converted into a variety of finished steel products on a rolling mill to be set up as part of the overall program.

The high cost of the pig iron produced has resulted in the relegation of local pig iron output to a stand-by proposition. The general idea seems to be to have sufficient capacity available when needed without making it weigh too heavily upon general consumption.

Technically, the industry must be able to operate with sufficiently satisfactory results utilizing exclusively Argentine ore. The local production of pig iron, however, would not be predicated upon the use of more than 10 pct of domestic iron ore, with the balance to be imported. Arrangements are already reported concluded to secure up to 1,000,000 tons of iron ore annually from Hainan Island (off the coast of Southeastern China) in exchange for Argentine wheat, but the problem of where and how to

### Domestic Resources of Both Iron Ore and Fuel Are Not Accessible

By GENE HARDY  
Washington Editor

obtain the coking coal remains to be solved.

The stand-by role assigned Argentine iron ore under the plan is largely dictated by the remoteness of the principal deposit, 80 to 100 million tons lying on the Sierra de Zapla near Palpala, Province of Jujuy, some 850 miles northwest of Buenos Aires. The ore is of high quality, but the cost of converting it into pig iron and of delivering it to the Rosario-Buenos Aires industrial area would be high because of the costliness of the charcoal charged in the blast furnace and the long distance over which the pig iron must travel to market.

Because of these difficulties, the bulk of the pig iron needed to produce the 315,000 tons of steel called for in the plan will be produced from foreign ore and coal. Argentine coal will be used to get started.

Steel will be produced in Siemens-Martin furnaces using pig iron produced from foreign raw materials, and alternatively and temporarily Argentine pig iron up to the required 10 pct.

Steel will be rolled in a modern rolling mill of large capacity to be constructed by the corporation. This mill is to be capable of rapid expansion, since the plan proposes an ultimate production of 800,000 tons of ingot steel annually for local conversion, as well as an export market.

This output in terms of finished steel would be generally in line with imports in the years immediately preceding the war, but would fall short of the 1,000,000 tons imported in both 1928 and 1929. Therefore, if Argentine consumption again reaches the million-ton level and if it is possible to carry out completely this ambitious new plan it would still be necessary for Argentina to import at least 400,-

000 tons of semi-finished and finished steel annually.

Processing and fabricating will be principally under the jurisdiction of private industry which will be allowed to finance its organizations freely.

The basic idea is to deliver to industry a semi-finished product at a price comparable to that which the same would have when manufactured outside the country.

This, it is expected, will make possible competition with foreign products, despite low volume, because of low manpower costs and savings on transportation and customs duties.

Nevertheless, Peron estimates that a subsidy of about 85,000,000 pesos may be necessary over a 10-year period to make up the difference between the cost price and the sale price of products manufactured by the company.

The semi-finished products will probably be distributed at less than cost. The sales prices will be fixed by the government based on prices prevailing in the lowest sector of the market in the United States, with, at most up to 5 pct additional.

In addition, the government will supply 90 pct of the estimated capital investment of 100,000,000 pesos. The hand of government is clearly visible throughout the entire plan. Industrialists can hold shares in the corporation, but the government's control is absolute. The military also has a large hand in the whole operation. Armco, S. A., is the only non-Argentine entity participating in the plan. Armco will provide the technical planning necessary for future installations.

Other advantages bestowed on the corporation by the government include: Assumption by the government of all deficits for 20 years; tariff protection if necessary; machinery, accessories and spare parts, and raw materials and fuels are free of customs duties and have been given preferential exchange status; and powers of expropriation have been extended to practically everything required to carry out the plan, including scrap (anyone holding more than a minimum quantity of scrap, 3 tons in the original legislation) must make periodic declarations.

## Stainless Steel Price Situation Still Hanging Fire

### Pittsburgh

• • • The question of an increase in stainless prices still seems to be hanging fire, but there is a growing resistance to such a move at this time. The report that the U. S. Steel Corp. would not raise stainless prices at this time seems to have met with tacit approval of other producers, despite the fact that their costs have been on the increase and on this basis alone an increase might be justified.

On the other hand, it is anticipated by some leading observers in the stainless industry that a price increase is inevitable and will likely be out by Sept. 1. Thus, the cross-fire of pro's and con's as to a stainless price increase has backers on either side and it is possible that some companies may increase prices and others hold back. The Steel Corp. indicated that its price increases would average about \$5 a ton, and this amount has been practically used up by the increases already made, making it unlikely that any change would be made in stainless prices.

However, the softness of the stainless market tends to hold stainless prices at present levels. Heavy industrial inventories of stainless plus heavy purchases by both job-

### Increase Questioned by Some Sources but Others Say Hike Is Inevitable

By TOM LLOYD  
Pittsburgh Regional Editor

bers and consumers of contract termination materials that have not moved as fast as anticipated is largely the reason for the current market conditions. The contract termination materials, in addition to being available for prompt deliveries, are available at reduced prices.

Many stainless users are currently liquidating these heavy inventories, and the recession in stainless demand is largely the result of excessive inventories. On the whole, stainless products are on a 4 to 10 week delivery schedule, which is practically the necessary lead time in producing the product.

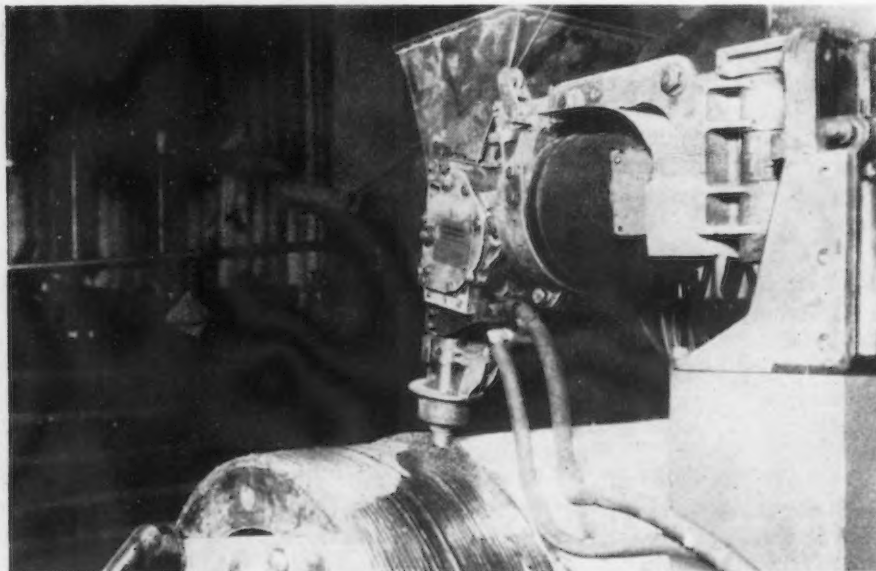
From a product basis, there are very few stainless items where deliveries are extended, the chief of which is probably fine wire. The capacity to produce fine wire was

not expanded greatly during the war, and the fact that fine wire does not require much tonnage has resulted in extended production schedules. Sheet demand has been off since the turn of the year, and warehouse stocks of sheet, plate, strip, bars and heavier wire items are good. In fact, many warehouses are overstocked on these items. Bar demand ended with the war and has not picked up appreciably from the low demand of the immediate post-war months.

There has been some intrusion into the stainless markets by aluminum, especially in the trailer business. However, this has not been of any major consequence and has not materially reduced stainless demand. One trailer manufacturer, on the other hand, is now tooling up to produce stainless trailers, having experimented with both carbon steels and aluminum. Railroad car manufacturers have maintained a steady demand for stainless. This business is steady in that producers of stainless cars usually do not produce aluminum cars, and vice versa. Consequently, the only effect of stainless consumption by railroad passenger car builders is in the total number of cars on order.

Thus, despite cost increases in the production of stainless that are comparable to those encountered by producers of tool and carbon steels, there is likely to be considerable buyers' resistance to price increases. Producers acknowledge this fact, but are caught in the middle. There is some prospect of a better stainless demand in big projects, particularly in the chemical industry, that are now in the engineering stage. Some observers are expecting this increase in demand to begin sometime late this year. How much of an impetus this will give the stainless industry is difficult to judge. There are many projects that are quite momentous in size. However, the non-availability of critical materials and the excessive increases in construction costs have been responsible for delay in some of these projects and may have an effect on their continuation or completion even during the fourth quarter of 1947.

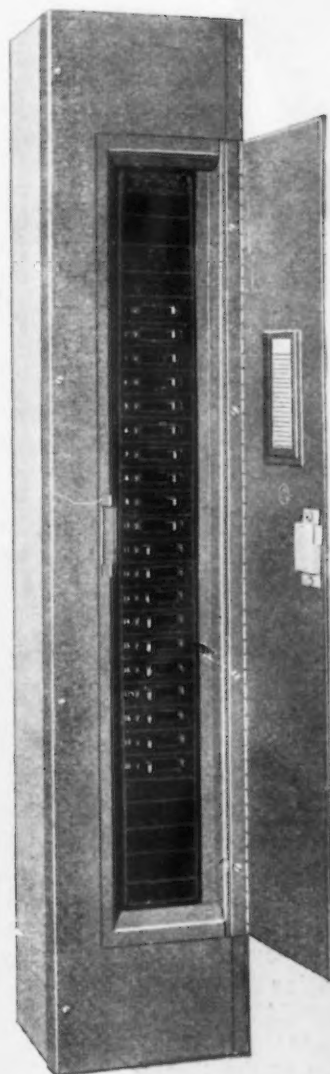
**THE BIG MELT:** Rather than scrap this 24-in. diam 9-ft long hydraulic press plunger because its bearing area was worn and pitted, a new surface was deposited on it by the Unionmelt welding process. The work was rotated in a lathe as the Unionmelt welding head, fixed to the lathe carriage, slowly traveled the length of the plunger. It was then turned down to its original size.





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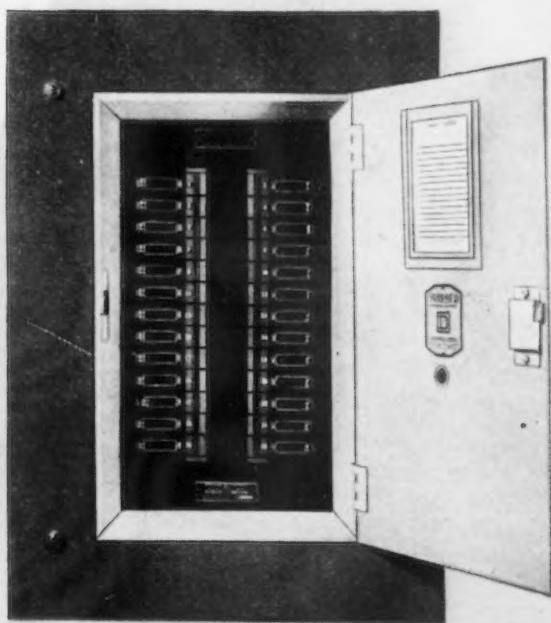
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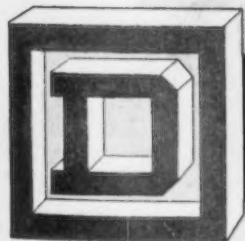
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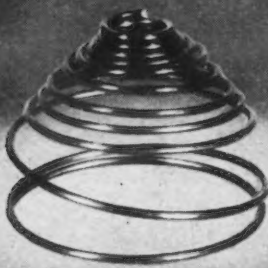
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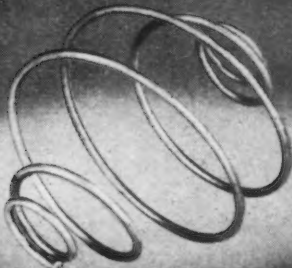
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## Tool Builders' Dinner To Fete Foreign Guests At Chicago Exposition

Cleveland

...National Machine Tool Builders' Assn. has announced that Brooks Emeny, president, Foreign Policy Assn. and consultant to the U. S. State Dept. since 1943 will be guest speaker at the NMTBA overseas dinner, Tuesday evening, Sept. 23, in the ballroom of the Palmer House, Chicago.

Charles J. Stilwell, president, Warner & Swasey Co., and former president, NMTBA, will be toastmaster.

The dinner is to be given in honor of visitors from overseas, representing the industrial na-

tions of the world, who will be in Chicago to attend the 1947 Machine Tool Show at the Dodge - Chicago plant, Sept. 17 through 26.



Brooks Emeny

Dr. Emeny is also president of Cleveland Council on Foreign Affairs, lecturer on International Relations at Yale, American delegate to the Tokyo Conference, Institute of Pacific Relations in 1935, was foreign political adviser to the late Wendell Willkie in 1940 and is the author of standard works on world politics. The subject of his address will be "The Tools of Reconstruction."

Large attendance of executives in the metalworking field from all parts of the world, particularly Europe and South America, is already assured the Machine Tool Show by the heavy advance registration from overseas, according to Donald M. Pattison, vice-president, Warner & Swasey Co., and chairman of the Overseas Dinner Committee of NMTBA.

Serving with him on the committee for the dinner are Nelson F. Caldwell, export manager, Cincinnati Milling Machine Co.; James C. Herbert, general sales manager, Jones & Lamson Co.; Ray F. Ingram, vice-president, Landis Tool Co.; Alexander S. Keller, vice-president and sales



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Buehler specimen preparation equipment is designed especially for the metallurgist, and is built with a high degree of precision and accuracy for the fast production of the finest quality of metallurgical specimens.

1. No. 1315 Press for the rapid moulding of specimen mounts, either bakelite or transparent plastic. Heating element can be raised and cooling blocks swung into position without releasing pressure on the mold.

2. No. 1210 Wet power grinder with  $\frac{3}{4}$  hp. ball bearing motor totally enclosed. Has two 12" wheels mounted on metal plates for coarse and medium grinding.

3. No. 1000 Cut-off machine is a heavy duty cutter for stock up to  $3\frac{1}{2}$ ". Powered with a 3 hp. totally enclosed motor with cut-off wheel, 12" x  $3\frac{3}{32}$ " x  $1\frac{1}{4}$ ".

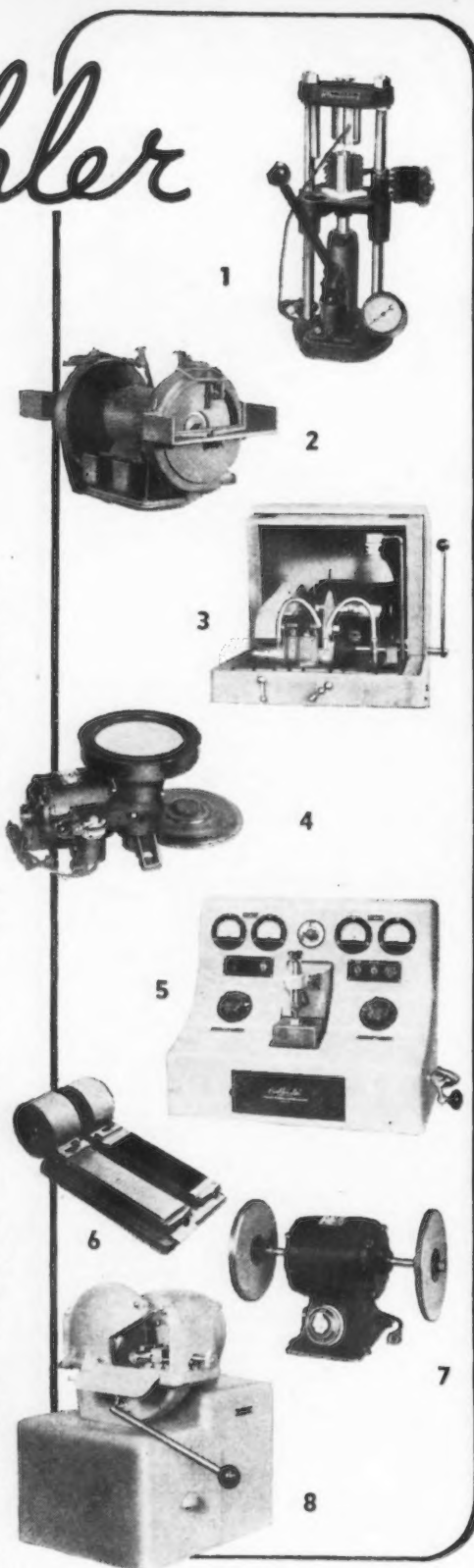
4. 1505-2AB Low Speed Polisher complete with 8" balanced bronze polishing disc. Mounted to  $\frac{1}{4}$  hp. ball bearing, two speed motor, with right angle gear reduction for 161 and 246 R.P.M. spindle speeds.

5. No. 1700 New Buehler-Waisman Electro Polisher produces scratch-free specimens in a fraction of the time usually required for polishing. Speed with dependable results is obtained with both ferrous and non-ferrous samples. Simple to operate—does not require an expert technician to produce good specimens.

6. No. 1410 Hand Grinder conveniently arranged for two stage grinding with medium and fine emery paper on twin grinding surfaces. A reserve supply of 150 ft. of abrasive paper is contained in rolls and can be quickly drawn into position for use.

7. No. 1400 Emery paper disc grinder. Four grades of abrasive paper are provided for grinding on the four sides of discs, 8" in diameter. Motor  $\frac{1}{3}$  hp. with two speeds, 575 and 1150 R.P.M.

8. No. 1015 Cut-off machine for table mounting with separate unit recirculating cooling system No. 1016. Motor 1 hp. with capacity for cutting 1" stock.



The Buehler Line of Specimen Preparation Equipment includes . . . Cut-off Machines • Specimen Mount Presses • Power Grinders • Emery Paper Grinders • Hand Grinders • Belt Surfactors • Mechanical and Electro Polishers • Polishing Cloths • Polishing Abrasives.

## Buehler Ltd.

A PARTNERSHIP

**METALLURGICAL APPARATUS**  
165 WEST WACKER DRIVE, CHICAGO 1, ILLINOIS

## NEWS OF INDUSTRY

manager, foreign department, Pratt & Whitney Co., and Cecil M. Peter, general sales manager, Fellows Gear Shaper Co.

Mr. Pattison announced that advance registrations already have been received at the National Machine Tool Builders Assn. offices in Cleveland from 26 countries. They are: Argentina, Australia, Austria, Belgium, British West Indies, Chile, China, Colombia, Cuba, Denmark, England, Finland, France, Hawaii, India, Italy, Mexico, the Netherlands, Norway, Palestine, Peru, Portugal, South Africa, Spain, Sweden, Switzerland.

In addition registrations have been received from offices in the United States of the following countries: Australia, Czechoslovakia, France, India, the Netherlands and Russia.

## Reveals Shortage Of Professional Help

Pittsburgh

• • • In a job guide issued by the Pennsylvania State Employment Service, it is reported that a labor market survey has been made of Allegheny and Beaver Counties, and part of Westmoreland County. These counties are in the industrial heart of western Pennsylvania.

The survey reveals many openings for skilled help as well as professional help. There is a shortage of accountants, bookkeepers, auditors and bookkeeping machine operators in the clerical field, while the active files show a surplus of general clerical workers, male and female. The professional service picture in this area reflects a condition that is state and nationwide. There is and will be for sometime in the future a serious shortage of graduate engineers, draftsmen and designers of all types.

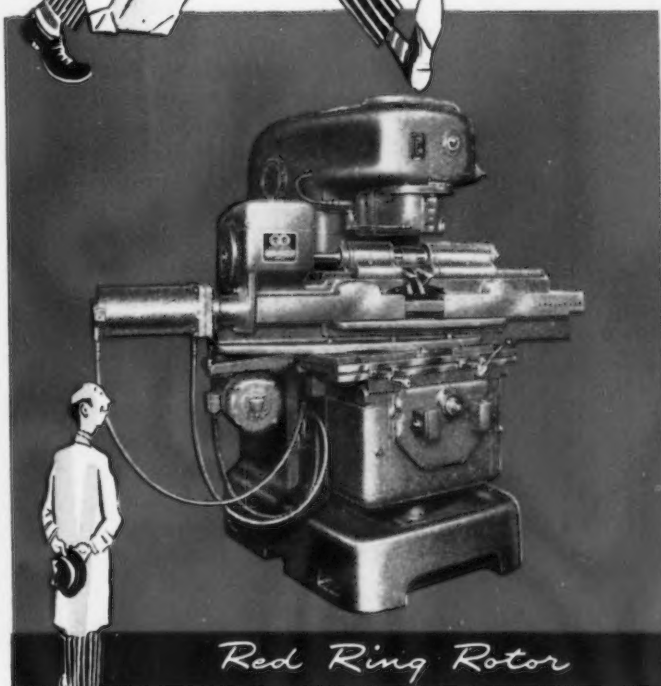
Locally, there are many openings for machinists and mechanics, including automobile mechanics, machine operators, and other related occupations. Construction workers, such as bricklayers, blocklayers, plasterers, carpenters and electricians, are in need at various points throughout the western Pennsylvania area.





# Going to the Machine Tool Show

If you are interested in modern precision gearing, its production and inspection, you will doubtless be interested in the new Red Ring equipment to be exhibited at the Machine Tool Show in Chicago, Sept. 17 to 26.



*Red Ring Rotor*

Featured in this exhibit will be the new Diagonal Gear Shaving Machine, a high production unit which has materially extended the field of gear shaving.

Another feature will be the new Red Ring Rotor Shaving Machine which has been so successful in reducing the cost of finishing the rotor laminations of electric motors.

Included also will be the standard gear shaving machines, a gear lapping machine, gear checking and sound testing machines.



*Red Ring Diagonal*

The latest in broaching practice with alloy broaches, broached parts and cutting tools will be there for your inspection.



National Broach engineers will be at BOOTH 607 to explain this equipment and answer your questions. You are cordially invited to stop by.

2709



## NATIONAL BROACH AND MACHINE CO.

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SPECIALISTS ON SPUR AND HELICAL INVOLUTE GEAR PRACTICE • ORIGINATORS OF ROTARY SHAVING AND ELLIPTOID TOOTH FORMS

THE IRON AGE, August 14, 1947—121

## Why You Find SPENCER TURBO COMPRESSORS in Foundries Everywhere

The principal reason why you find so many Spencer Turbos on cupolas is the reliability experienced over years of service.

Simplicity is the answer. One rotating element with wide clearances and only two bearings. Cast iron bridge construction and light weight balanced impellers mean minimum vibration, no special foundations and negligible wear even after years of service.

Hand or automatic blast gate control—any capacity required. Ask for bulletin No. 112.

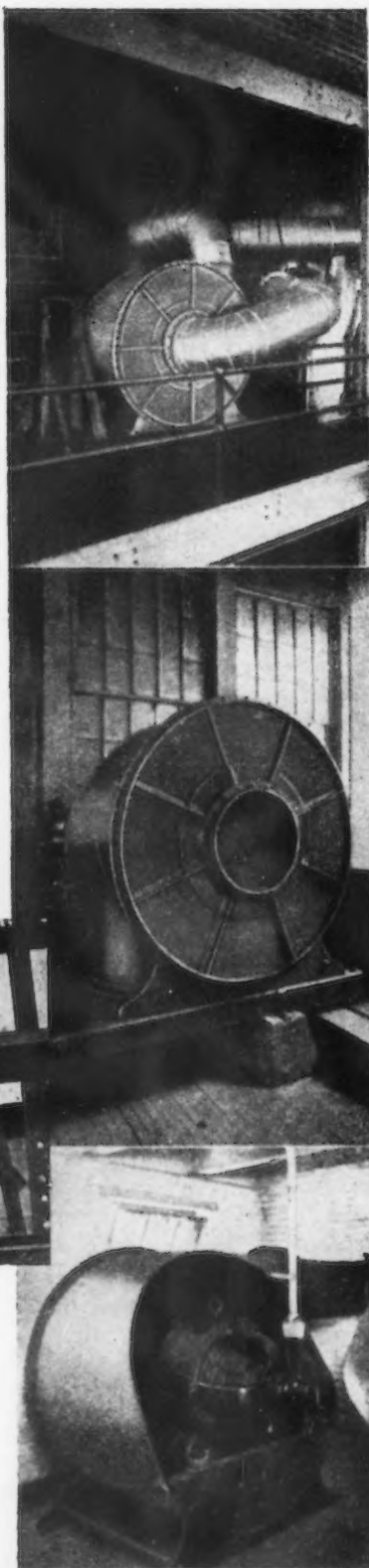
### AND SPENCER FOR CLEANING

The dust count is reduced, molds and patterns cleaned in modern foundries with Spencer Portable and Stationary Vacuum Cleaning Systems. Ask for the bulletins.



#### ASK FOR BULLETINS

Foundries . . . . .	No. 112
Data Book . . . . .	No. 107
Gas Boosters . . . . .	No. 109
Four Bearing . . . . .	No. 110
Blast Gates . . . . .	No. 122
Technical Bulletin . . . . .	No. 126



332-B

**SPENCER**  
HARTFORD

THE SPENCER TURBINE CO.  
HARTFORD 6, CONN.

## NEWS OF INDUSTRY

### British Shipbuilding Backlog Increasing As Completions Drop

London

• • • The statistics issued by Lloyd's Register of Shipping regarding merchant vessels under construction at the end of June show that in Great Britain and Ireland there is an increase of 31,234 tons in the work in process as compared with the figures for the previous quarter. The total of 2,062,949 tons gross has not been exceeded since March, 1922.

The increase in the tonnage of vessels under construction which has been shown for the last year reflects the delays which materials shortages are imposing upon the completion of ships, and the consequent prolongation of the time required for their building. At the end of June the tonnage on which work was suspended amounted to 4,136 tons.

Of the tonnage being built in Britain, 28 pct is for registration in other countries. The tonnage of merchant vessels under construction abroad at the end of June is shown as 1,783,707 tons gross, which is 72,107 tons more than that recorded at the end of March last, when no figures were included for Danzig, Germany, Japan, Poland, and Russia, and the information concerning France was incomplete. Returns have since been received in respect of Poland, including Danzig, and the figures for France are now considered to be comprehensive.

The leading countries abroad are:— Sweden, 266,905 tons; France, 236,678 tons; Holland, 224,428 tons; British Dominions etc., 221,494 tons (including Canada, 161,160 tons); Italy, 191,342 tons; United States of America, 183,236 tons; Denmark 139,992 tons; and Spain, 112,524 tons.

The total tonnage under construction in the world amounts to 3,846,656 tons gross, of which 53.6 pct is being built in Great Britain.

### Manganese Ore Shipped

London

• • • Total exports of manganese ore from South Africa during 1946, according to the Department of Mines, were 356,166 long tons.





# Vaughn

## **COLD DRAWING MACHINERY**

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In short, your every requirement for dependable, productive Cold Drawing Equipment is met in the complete VAUGHN Line. Let us cooperate with you on your current drawing problems.

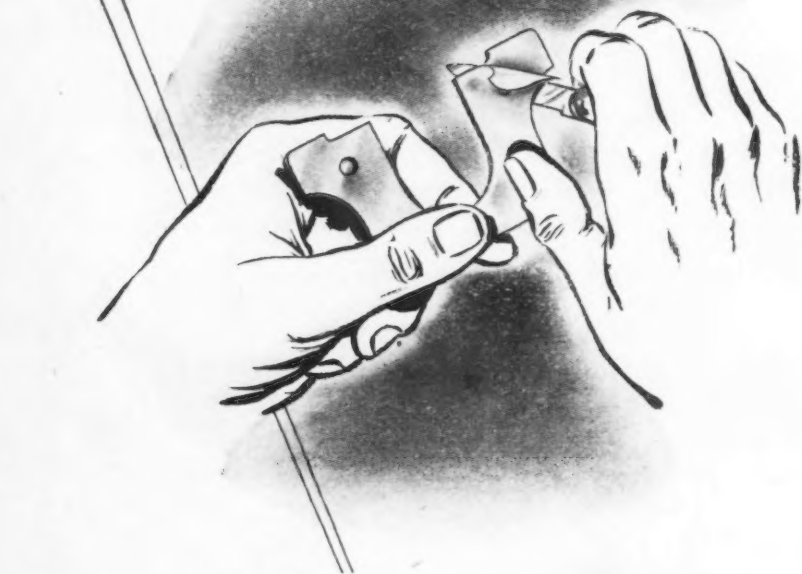


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MACHINERY CO.

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OHIO, U.S.A.

## QUICKER KNOW-HOW for new workers



THE KNOWN precision gauge of laminations in the solidly bonded Laminum shim makes machining unnecessary in fitting machine parts. But consider this too . . . it assures accuracy by preventing errors (sometimes spoilage) due to inexperience. Want performance data?

*Laminum shims are cut to your specifications. For maintenance, however, shim materials are sold through industrial distributors.*

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# LAMINUM

THE SOLID SHIM THAT *peels* FOR ADJUSTMENT

## Gas Storage in Pipes Being Tested to Aid In Low Pressure Areas

Pittsburgh

• • • A pilot installation using pressure vessels fabricated from lengths of seamless steel pipe for storing 1,250,000 cu ft of natural gas at 2240 psi was recently placed in service by the Public Service Co., of Illinois near Kankakee. It is intended to supplement low pressure distribution in the Kankakee area and provide an emergency supply for high pressure customers in the area normally supplied from the high pressure distribution feeder main from Mattison, Ill. Another unit capable of storing 40 million cu ft is now in process of construction at Evanston, Ill.

The basic design was developed by the Public Service Co. of Illinois, Stone and Webster, and National Tube Co., the latter producing the seamless pipe at its Lorain, Ohio, plant. This pipe, of alloy steel having a yield point in excess of 80,000 psi, is furnished by the mill in 40-ft lengths, 24-in. O.D. and 0.512-in. wall thickness.

Each end is hot swaged to contour in five stages at National Tube Co.'s Christy Park works near McKeesport, Pa., using a 2000-lb steam hammer. One end is then cut to length and rough bored, after which the cylinder is normalized to produce the desired grain structure in the steel.

Following this operation the cylinder is shot blasted and both necks finished to the required size in a special horizontal boring mill. The cylinders are then subjected to a 2800-lb psi hydrostatic test in a water jacket to determine that the permanent set at this pressure does not exceed prescribed limitations, following which they are prepared to receive a mastic coating and the ends plugged for shipping.

Fifty lengths of pipe, fabricated into storage cylinders, arranged in five lines of eight units, four on each side of a manifold, were used in the Kankakee installation and 160 similar units will be required at Evanston. Each unit, on an average, has an internal volume of 109.66 cu ft and is capable of stor-



ing approximately 30,000 cu ft of natural gas.

Of particular interest to companies using these storage units is the compressibility factor of natural gas, which shows maximum deviation from the laws of perfect gases near the pressure of 2240 psi at which the gas is stored. Whereas approximately 160 cu ft of a perfect gas could be stored in one cubic foot of space at 2240 psi pressure and 40°F temperature, it is possible to store approximately 230 cu ft of natural gas under the same conditions. Forty lengths of pipe are considered sufficient for storing 1 million cu ft of natural gas. Standard spacing for the tubular storage units is 8 ft end to end and 15 ft between center lines. All piping is coated and provided with cathodic protection. Earth cover of 3½ ft is sufficient to minimize seasonal temperature changes.

It is expected that underground high pressure pipe storage units will meet a long-felt need. Should failure of a single pipe occur, it will not affect adjacent units and further, a unit may be taken out of service for inspection or repair without disturbing the remainder. Being underground, no aviation hazards are involved, nor are the storage units affected by storms or rapidly fluctuating temperature conditions.

Practically any size storage unit can be assembled as desired and a high percentage of the stored gas is instantly available at distribution pressure. It is not necessary to provide high capacity compressing equipment for storing the gas as this can be done over a period of time since the facilities are primarily intended for emergency use only. Single pipe storage units weigh only about 5000 lb each before coating and may be easily handled and installed without the use of special equipment in the field.

### Establishes Mercy Priority

Washington

• • • Under a revised procedure, a "mercy" priority has been established by WAA by which all surplus property not sold, leased or committed will be made instantly available for use in connection with floods and other disasters or emergencies upon presidential request.

## Introducing . . . . the SONIGAGE

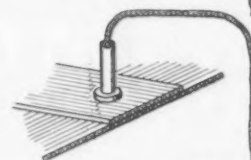
Photocon Research Products is pleased to announce the addition of the Soni-Gage to its line of precision electronic instruments. The automatic Soni-Gage is a supersonic instrument for measuring thickness and testing for flaws and bonds.

The automatic Soni-Gage quickly measures the thickness of sections which are accessible from one side only. Sections from .015 to .300 inches thick may be measured directly, and sections to several inches thick may be measured by a simple indirect method.

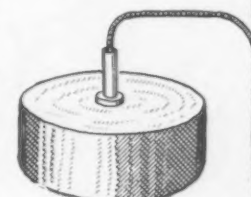
Flaws such as laminations, shrinkage cracks, and porosity as well as flaws in very thin materials are located quickly with the automatic Soni-gage. Production checking of metal cement bonds is an increasingly popular application.



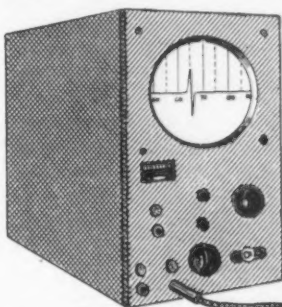
MEASURE WALL THICKNESS



CHECK BONDS



CHECK FLAWS



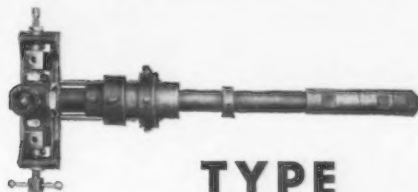
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Manufacturers of fine electronic Instruments for Science and Industry. Manufactured under license from General Motors Corporation.



## REDUCES NUMBER OF BURNERS NEEDED . .

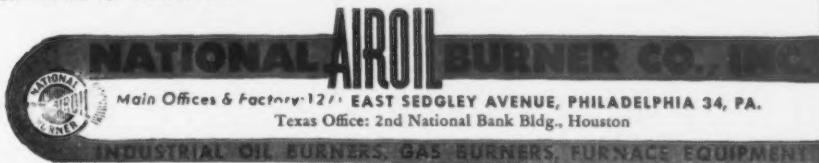


TYPE

# "SAL"

OIL BURNER

Type "SAL" Steam Atomizing Oil Burner assures high fuel capacity . . . thus reducing the number of burners needed. Because of thorough atomization, it produces a clean, steady, well-defined flame, which completely burns the fuel oil. Type "SAL" Oil Burners are adaptable to dual fuel systems on large boilers . . . are frequently used to fire fuel oil above existing coal stokers. For detailed information—write for Bulletin 24.



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New Center Building

#### NEWS OF INDUSTRY

### Government Feeling Overcharged on Hauls Of Steel Landing Mats

Washington

••• Attorney General Tom C. Clark has announced the filing with the Interstate Commerce Commission of a complaint against more than 900 railroads, in which the government seeks recovery of alleged overcharges made by the carriers for transporting during the war thousands of carloads of steel airplane landing mats from eastern origins to Pacific Coast points.

"For a great many years," Attorney General Clark said, "the railroads have given substantially equal rates to hundreds of articles made from iron and steel, even though many of the articles are dissimilar. The steel landing mats involved here were not dissimilar to many iron and steel articles given more favorable rate treatment in the railroads' tariffs; yet in the midst of the war the railroads refused the government's request for rates on these landing mats equal to that accorded other articles made from iron and steel. Accordingly, the government was required to pay, in many instances, more than six times as much as any other shipper for the equivalent transportation of similar iron and steel articles."

### States Use of Cobalt As an Alloy in Steels Has Increased Demand

Washington

••• Wartime development of the use of cobalt as an alloy in steels has resulted in a postwar demand exceeding that of the peak war year, it is stated in the first reprint chapter of the 1946 Mineral Yearbook, published by the Bureau of Mines.

Manufacture of magnets and magnet steel in 1946 consumed 1,456,522 lb of cobalt, approximately 32 pct more than was used for the same purpose in 1945 and represents about 35 pct of all the cobalt used during that year.

Many improvements in radio and the electronics fields have greatly increased the demand for magnetic



steels; wartime development of high temperature alloys has greatly expanded the demand and further increases are predicted by the bureau which reports growing use in making welding rods, die and valve steel, stock for tipping tools, and other uses.

A recent report by the Legislative Reference Service, Library of Congress, of the mineral position of the United States stated that at the present rate of consumption the United States had cobalt reserves sufficient for about a half century. However, the present rate of production is leaving the nation partially dependent upon foreign sources for its needs.

Reflecting the increasing use of cobalt, imports were 27 pct less last year than in 1945. The Belgian Congo continued to be the chief source of the metal from abroad, supplying 250,000 lbs of metal and 1.7 million lb of alloy containing 713,000 lb of cobalt. Belgium is the second largest foreign source.

Printed copies of the cobalt chapter of the yearbook may be obtained at 5¢ each from the Supt. of Documents, Washington 25.

### Labor-Management Time Study Plan Being Tried

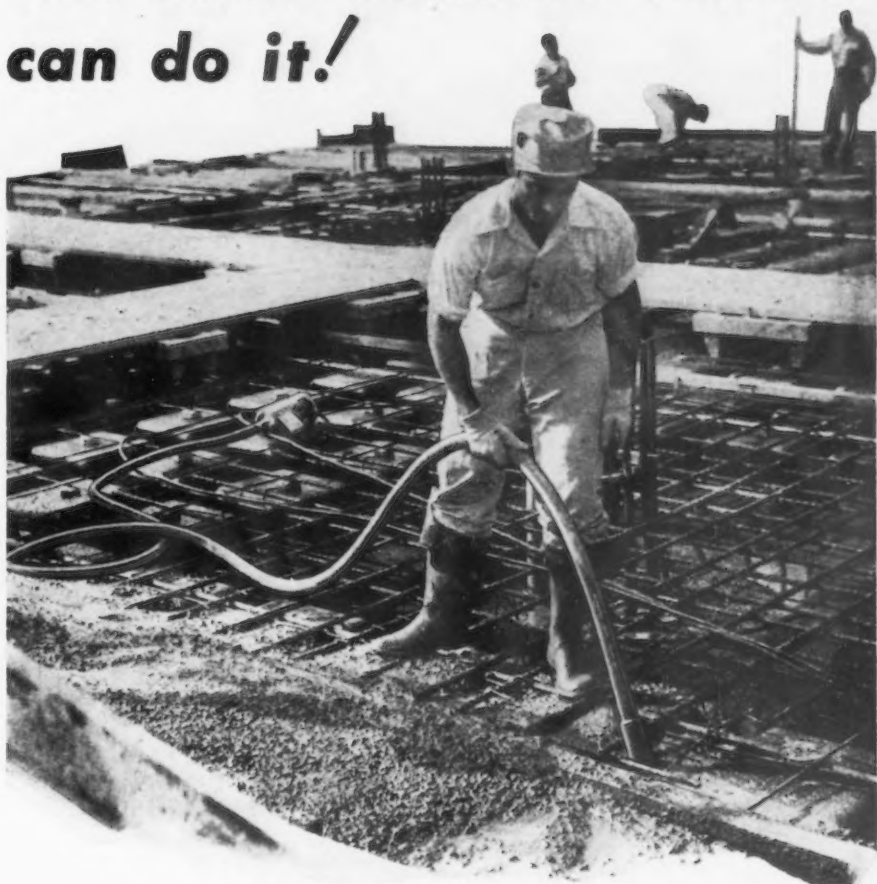
Pittsburgh

••• Making organized labor a direct part of production and cost planning is an innovation in labor-management teamwork currently being tested by Oliver Iron & Steel Corp., Pittsburgh. This teamwork is accomplished by a Time Study & Methods Dept. composed of both labor and management representatives who make the studies and develop recommendations jointly.

An educational program is also being presented to shop foremen, assistant foremen, union shop stewards and other union representatives to enable them to take an active part in the time study and methods engineering work regularly conducted by the company.

A continuation of the educational program, which was started last June, was presented recently in a time study and methods motion picture shown in the plant offices. This was a series of individual reels covering various phases of the subject which were

## RUGGED DUTY... but S.S. WHITE FLEXIBLE SHAFTS can do it!



Here's an application that provides as convincing proof as anyone could ask of the dependable performance of S. S. White power drive flexible shafts in hard service. It's a concrete vibrator, product of the Viber Co., Burbank, Calif. It is used to agitate poured concrete to make it flow to all parts of a mold and to compact it. The .437" flexible shaft, operating inside a special casing at a speed of over 9000 rpm, transmits rotary power from the driving unit to the vibrator.

Used in the construction of buildings, bridges, dams, etc., the equipment gets plenty of hard usage under tough conditions. But the flexible shaft—although continually bent every which way—does its job dependably, day after day.

The large range of S. S. White power drive flexible shafts makes it possible to develop portable equipment for a wide variety of both light and heavy duty jobs.

### WRITE FOR 260-PAGE HANDBOOK — FREE

The 260 page S.S. White Flexible Shaft Handbook gives full facts about flexible shafts and their application. A copy is yours—free—if you will write for it on your business letterhead and state your position.



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THE S. S. WHITE DENTAL MFG. CO. DIVISION



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FLEXIBLE SHAFTS • FLEXIBLE SHAFT TOOLS • AIRCRAFT ACCESSORIES  
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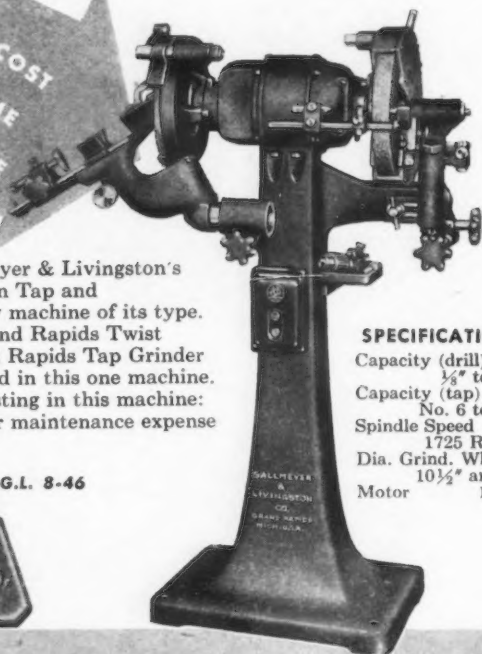
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GRAND RAPIDS Combination Tap and  
Drill Grinder is the only machine of its type.  
All of the advantages of the Grand Rapids Twist  
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You save three ways by investing in this machine:  
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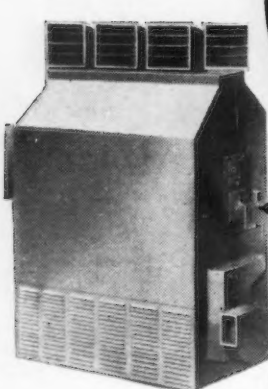
Write for Bulletin G.L. 8-46



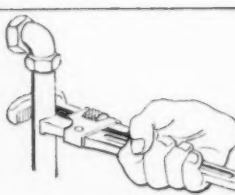
## SPECIFICATIONS

Capacity (drill)  $\frac{1}{8}$ " to  $1\frac{1}{2}$ "  
Capacity (tap) No. 6 to  $1\frac{1}{2}$ "  
Spindle Speed 1725 R.P.M.  
Dia. Grind. Wheels  $10\frac{1}{2}$ " and 12"  
Motor 1 H.P.

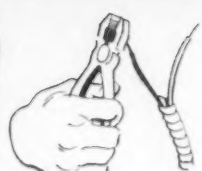
**What "GRAND RAPIDS" Quality Means:** Gallmeyer & Livingston cast their close-grained gray iron, machine to micrometric tolerances, precision-assemble grinding machinery of unsurpassed performance. *Grand Rapids* means top quality in grinding machinery.  
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**1** CONNECT GAS OR  
OIL FUEL LINE



**2** CONNECT POWER  
LINE



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## NEWS OF INDUSTRY

prepared by Dr. Ralph M. Barnes, Professor of Industrial Engineering at the University of Iowa and nationally recognized authority on time study and incentive plans.

**The Time Study & Methods Dept.** at Oliver Iron & Steel has been organized so that its personnel is balanced with union representatives who regularly work as a part of the department.

In this way equally balanced labor-management time study and methods teams have been formed to make joint analyses of job requirements and other production factors. Thus, job timing, mechanical improvements, operation costs and related problems can be studied jointly and recommendations made which are mutually satisfactory to labor and management.

This is believed to be one of the first instances where this form of collective bargaining—by joint unbiased study—has been carried directly to the workmen by a plan which actually makes organized labor a part of management planning. The initial program, originated with the company in 1940 and has since progressed to its present high level of efficiency. Still more complete application of the principles will continue to be developed and it is planned that the educational part of the program will be offered to the entire union membership through special programs at the union halls.

## WAA Pushing Furnaces At 36 to 75 Pct Off

Washington

• • • Renewing its effort to dispose of slow-moving heat-treating furnaces and ovens, WAA is offering \$43 million worth, ranging in cost value from \$500 to \$250,000 each, at fixed prices ranging from 36 to 75 pct of original cost.

They include both foundation and portable types for heat-treating metals and heating and reheating specialties as well as ovens for enameling, japanning and lacquering.

Principal inventories are held by WAA regional offices at Boston, Chicago, Cincinnati, Cleveland, Detroit, New York, Philadelphia, Richmond, St. Louis, Kansas City, Grand Prairie, and Birmingham.



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is Based On Solid **BRASS**



WHEN great music swells along the air waves and wells up in your living room — there's a deep magic which never loses its spell.

In conjuring up this magic, Brass plays many vital supporting parts, for which it is perfectly "cast" by reason of characteristics like these: Exceptional qualities of resonance . . . non-interference with clear reception . . . high resistance to corrosion under all atmospheric conditions. Now add the unique advantages of Brass in production . . . as one example, the forming of perfect radio tube-bases *in one operation*, where other metals would require several operations. There, in sum, is a combination of qualities which can't be matched — either in fabrication or use — by any other material.

And whatever combination of qualities you may require of Brass to be used in *your* product, be sure that you can get that exact alloy in Bristol Brass sheet, rod, and wire. Be sure, too, that Bristol will supply your needs promptly, and precisely to specification, shipment after shipment. And now, to determine the advantages which Brass will bring to your product . . . both production-wise and sales-wise . . . you are invited to write to the Sales Engineering Department here at the Bristol mills.

*The*  
**BRISTOL BRASS**  
CORPORATION

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## NEWS OF INDUSTRY

### Porcelain Shipments Hit \$7,600,000 in May

Pittsburgh

• • • The \$7,600,000 worth of porcelain enameled products shipped during May 1947, represents an increase of 46 pct over May 1946 shipments, according to the Porcelain Enamel Institute, Washington. May shipments were only 6 pct short of the all-time high total of \$8,100,000 set in April 1947.

Latest figures reported by the institute boost total shipments for the first 5 months of 1947 to \$37,900,000, an increase of 51 pct over the January-May 1946 total, and 152 pct over the equivalent figure for 1945.

The steady upward trend in porcelain enamel shipments is indicated by figures showing increases in all phases of the industry. Washing machine, refrigerator, and stove parts showed the largest shipment volume, their total being 66 pct above the May 1946 figure.

These figures include all forms of porcelain enamel products except finished plumbing ware. Plumbing products done a jobbing basis were included.

### American Stove Plant Goes Into Production

Cleveland

• • • Magic Chef heavy duty gas cooking equipment began rolling from assembly lines in the new American Stove Co. plant in Cleveland, July 16, according to Stanley E. Little, their vice-president in charge of sales.

The plant, a former war production facility, is designed and equipped to produce at a rate of between two and three times that of prewar production schedules. It was purchased and equipped with new machinery at a cost of considerably more than \$1,000,000. "This is just one phase of the company's multi-million dollar postwar expansion program," said Mr. Little.

The new building was purchased in 1946. Wartime materials were removed and Magic Chef equipment began moving into the new quarters this spring. It is anticipated that by October the last moving will be completed and full production attained at the new headquarters, 3201 Harvard Avenue.



# Here's the New SUNDSTRAND Triplex Rigidmil

FOR CARBIDE MILLING AT  
EXTREME ACCURACIES OVER  
A WIDE RANGE OF WORK

Here's flexibility in a production type Rigidmil, flexibility to accommodate both wide and narrow parts. Further, the basic design of this machine allows this extreme flexibility without sacrifice in accuracy. Three 25 horsepower spindle heads, one vertical, two horizontal, can be adjusted to mill three sides of a part simultaneously. Ample horsepower permits carbide milling. The vertical spindle head is mounted on vertical ways, has power movement and power clamping. It is carried on a cross-rail which has power movement and power clamping for positioning the vertical spindle crosswise to the machine table.

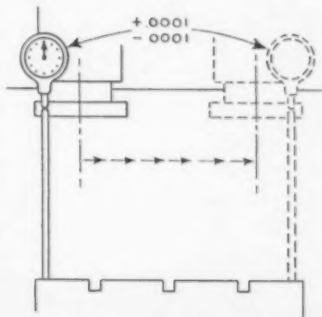
The illustrations to the right indicate the wide range of workpieces which can be accommodated on the Sundstrand Triplex Rigidmil. This versatility is provided through spindle and crossrail adjustments.

## Three 25 H. P. Heads for Carbide Milling

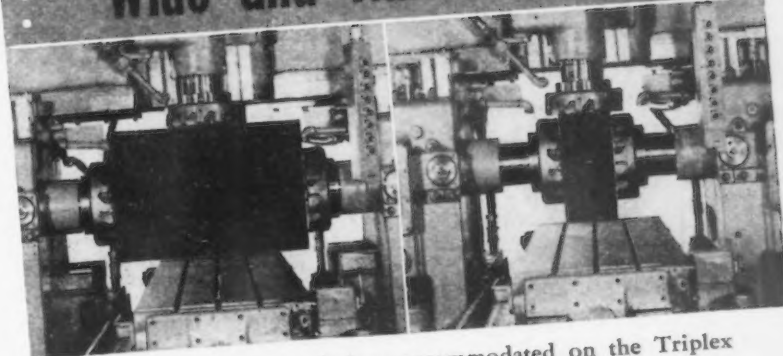
A total of 75 horsepower can be put through this machine with three heads working simultaneously.

## Built-in Accuracy Assures More Accurate Milling

Note the drawing shown at right. This accuracy is possible because of the unique design of the cross rail. This heavy part is designed to rest flat on its ways and consequently cannot shift or move during machining. Micrometer adjustment insures accurate positioning of the spindles.



Handles BOTH  
Wide and Narrow Parts



Left — Maximum workpiece accommodated on the Triplex  
Right — Minimum workpiece accommodated on the Triplex

See this and Other Sundstrand Machines in  
Action in Booth No. 20 at the machine tool show,  
Dodge Plant, Chicago, Sept. 17-26.

## FREE ADDITIONAL DATA

is included in this new bulletin covering details and specifications of this new outstanding machine. Write for your copy today. Ask for Bulletin No. 563.



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## British Committee Reports on German Powder Metallurgy

Washington

• • • Highly intricate dies employing a number of independent punches fitted in die subpress were used by the Germans in pressing rifle and gun parts from powdered metals according to a British report on German powder metallurgy now on sale by the office of Technical Services, Dept. of Commerce. Iron powders were also used for porous iron bushings, bearings, sliding parts, gears, bullet slugs, precision parts for rifles and diamond impregnated iron lapping wheels.

The entire assembly was designed for use in a standard type of hydraulic press with top and bottom rams which eliminated the need for complicated presses with multiple die movements, the report states.

The report was made by an industrial intelligence team of the British Intelligence Objectives Subcommittee and is based on visits to 10 German plants. A second report on iron powder metallurgy, made by J. C. Richards of the Australian Scientific and Technical Mission, is also available from OTS. This report gives notes on German production methods at two additional plants.

Copper and iron powders were given most attention since these two metal powders form the most important constituents by volume and weight employed in powder metallurgy today.

Owing to shortages of raw material, the investigators found that Germany was unable to produce any important amounts of copper powder during the war and iron powders were substituted. Production of iron powders rose from 200 tons in 1938 to 32,000 tons in 1944. The Germans claimed that the manufacture of shell driving bands consumed 1000 tons of iron powder alone per month during 1943-44.

Although electrolytic deposition, atomization, and reduction processes were used, the bulk of German iron powder manufacture was by the "Hematag" mechanical crushing process. In 1944 about 75 pct of the total production was by the "Hematag" process.

The only improvements over American and British practices noted by the investigators were in sintering furnaces. There were, however, unique improvements in specific plants which were not industry-wide.

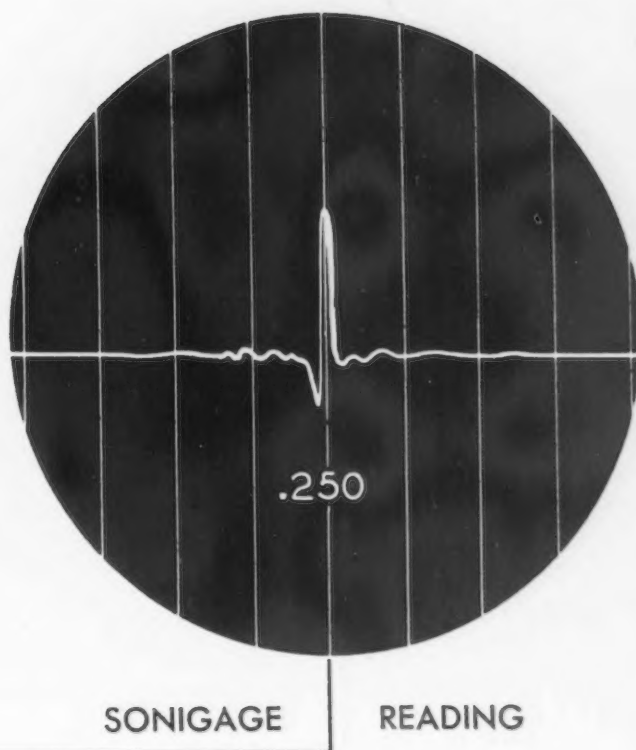
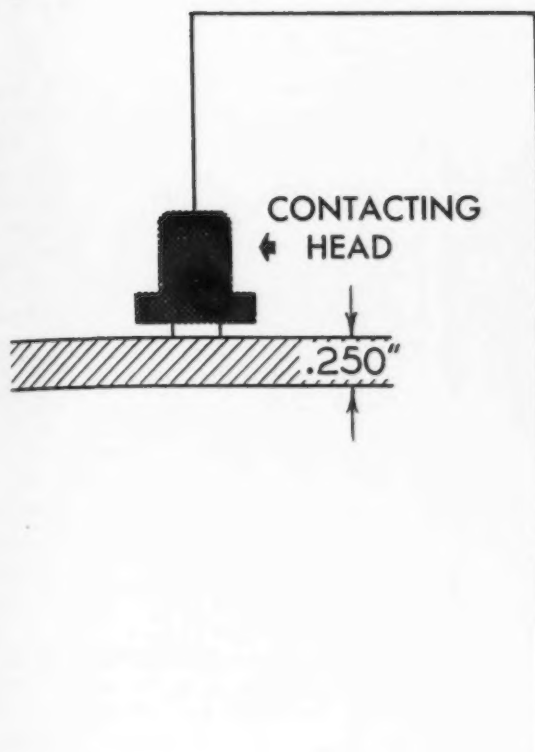
At the Vereingte Deutsche Metallwerke, A. G., at Neurod, the team investigated two types of sintering furnaces made by Elinco of Kresbsoge, Rhineland, and Siebert of Hanau. The Elinco furnaces are straight through tunnel furnaces, the work being packed into boxes and loaded into an end compartment and removed in a similar way at the other end or simply pushed into an open end and conveyed through without a charging compartment.

Orders for the report PB-63874 Metal Powders (sintered); 152 pp., diagrams, graphs, tables; microfilm, \$4; photostat, \$11, and PB-63610 Iron Powder, Notes on German Production Methods at Dusseldorfer Eisenhuttengesellschaft, and Deutsche Eisenwerke; 19 pp., photos, diagrams; microfilm, \$1; photostat \$2, should be sent to the Office of Technical Services, Dept. of Commerce, Washington 25, and should be accompanied by check or money order, payable to the Treasurer of the United States.

**PLENTY OF PIPE:** Radiant heating installation at National Tube Co.'s quarter mile long warehouse, Lorain, Ohio, will use 25 miles of 1-in. steel pipe. It will be grouped in 481 coils, one shown in foreground, in this view showing 10 in. of concrete being poured for the floor at U. S. Steel's pipe making subsidiary.







MAGNAFLUX CORPORATION is pleased to announce that it has been licensed by GENERAL MOTORS CORPORATION to manufacture and sell the Supersonic instrument developed by General Motors Research Division and called the Sonigage.

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- \* The Magnaflux Sonigage is adapted to the measurement of thickness of non-porous materials from one side only and to the location of subsurface defects.
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- \* Magnaflux Corporation invites your inquiries with details of your application.



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THE IRON AGE, August 14, 1947—133

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## C & O Expanding Its Export Freight Dept. As Shipments Fall

*Cleveland*

... Reorganization of the foreign freight department of Chesapeake & Ohio Railway Co. for expansion of export, import, intercoastal and coastwise freight business was announced here last week by Robert J. Bowman, president.



Robert J. Bowman

According to Mr. Bowman, the department has been renamed the World Commerce Dept., as the first step in the reorganization.

Expansion of the department, effective Aug. 1, comes at a time when government and UNRRA shipments are declining steadily and railroads once more are seeking business which there was no need to solicit during and immediately following the war.

George C. Marquardt, formerly assistant foreign freight agent at Chicago, has been named general manager of the new World Commerce Dept. with headquarters in the Woolworth Bldg., New York. He will have supervision over offices in Chicago and Richmond and a new office in Detroit.

Most of the export, import, intercoastal and coastwise shipments handled by the C&O pass through its eastern terminus, Newport News, Va., where the C&O handled 390,144 tons of export freight and 90,681 tons of import freight the first 6 months of 1947. In the corresponding period of 1946, exports totaled 427,902 tons and imports 97,594. In all of 1946, export freight handled amounted to 728,636 tons and import freight, 190,063 tons.

Decline in exports the first half of this year compared with the first 6 months of 1946 reflects the decrease in government shipments, Mr. Bowman said. But he foresees in coming months a vastly increased movement of commodities from the midwest for rehabilitation of Europe. These



## NEWS OF INDUSTRY

commodities will consist principally of agricultural implements, food supplies, iron and steel products and livestock.

The World Commerce Dept.'s duties will be to assist exporters and importers and to foster trade by keeping exporters advised as to requirements of firms in other countries.

Department personnel will be ready to help obtain irrevocable letters of credit for firms entering the export market for the first time; explain customs requirements of countries to which goods is destined; arrange contracts for transportation of goods from an overseas port to its destination; arrange for space on steamships, and make suggestions to shippers for handling consul documents and other export papers.

### Barium Reports Net Profit Up Over '46

New York

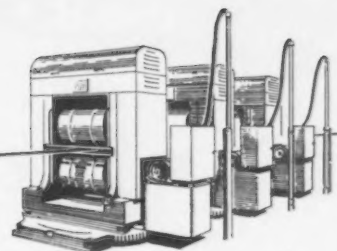
••• The Barium Steel Corp. reports net earnings for the 6 months ended June 30 of \$789,123, equal to 40¢ a share on the outstanding capital stock, after all charges and after providing \$483,655 for estimated federal income taxes. For the first 6 months of 1946 Barium showed a loss of \$82,132 for the consolidated operations.

For the second quarter ended June 30, Barium reports consolidated net earnings of \$408,429, after all charges and after providing for estimated federal income taxes. Sales for the first 6 months of the year amounted to \$18,500,000 and unfilled business as of June 30 approximated \$24,000,000.

### Reports Rise in Earnings

Buffalo

••• The Buffalo Forge Co. and subsidiaries report for the quarter ended May 31 net profit of \$878,404, or \$2.70 a share after provision for U. S. and Canadian income taxes. Earnings in the quarter ended February 28 were \$636,777 or \$1.96 a share and for the corresponding quarter of 1946 they were \$237,525 or 73¢ a share. The fiscal year ends Nov. 30.



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...all types and gauges...

### REVOLUTIONARY FEATURES

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**"SOLVOL**  
increased carbide  
drill life more  
than 150%..."



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Oil Co.  
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**this is the story...**

"Using a competitive soluble oil, this manufacturer was getting from twenty to twenty-five holes per carbide drill, being used on angular crankshaft oil holes. The drills in many cases were seizing and flaking as they became dull. Production rate was very slow and cost per crankshaft much higher than they had anticipated. SOLVOL LIQUID CUTTING COMPOUND was put on the job at a twenty to one dilution. Drill life immediately increased to sixty-five holes per drill. Flaking was eliminated entirely. The production rate accordingly increased with reduction of crankshaft machining costs."

*J. P. Tomlinson*

This actual performance report from Stuart's files provides additional proof that the *right* cutting fluid can make the difference between profit and loss on many metal-cutting operations. Put an experienced Stuart engineer to work on *your* cutting problems... his service, supported by complete specialized laboratory facilities, is available for the asking.

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## Pennsylvania Shows Moderate Increase In Total Employment

Pittsburgh

... Employment in manufacturing and nonmanufacturing industries of Western Pennsylvania, according to the Pennsylvania State Employment Service, was stable from April to June, with 222 major firms increasing employment from 184,400 in April to 185,200 in June. Employer reports from these firms indicate a moderately increasing employment trend during July and August, mainly in manufacturing industries such as primary metal processing and metal fabricating; machinery and electrical equipment; transportation equipment manufacturing, and other miscellaneous producers.

The truck strike in this area caused some layoffs in manufacturing plants and trade establishments. Employees temporarily furloughed by steel, railroads and kindred industries during coal wage negotiations have been recalled to work.

The Pittsburgh office of PSES carries 15,500 men and 5500 women on their lists of unemployed. Of these, 11,100 are workers with industrial experience ranging from unskilled to highly skilled; 5700 are white collar workers with professional, managerial, technical and clerical skills, and 4200 are domestic and service type workers.

In the Ohio River Valley area, particularly the Ambridge - Aliquippa, Pa., area, employment is leveling off but workers laid off by one industry are being absorbed by another. Steel mill laborers are currently in demand. Unemployment is estimated at 1200, and the surplus includes many overaged, inexperienced, and physically handicapped applicants. Braddock, Pa., appears to have an ample labor supply with steel employment at its peak. Millwrights and machinists are in demand. The Carnegie, Pa., area employment picture is stable, with an anticipated increase in labor demand when Sumerville Tubing Co. completes its move from Norristown, Pa., to Carnegie.

Employment in the metal indus-

tries around McKeesport is leveling off. Production remains steady at a high rate, and the tool industry in this area is recovering from a temporary lull. The New Kensington - Vandergrift sections shows 400 glass workers laid off until Sept. 1 as a result of a plant repair program. A large supply of workers is available here, with estimated unemployment set at 3200 men and 1800 women. A strike affecting 900 workers is still in progress in this area.

## Expands to Meet Demand

Buffalo

... The National Gypsum Co. earned a net profit of \$2,531,446 in the 6 months ended June 30, equivalent to \$1.39 a common share, which compared with \$1.727,218, or 93¢ a share, in the same period last year.

In his semiannual report to stockholders, Melvin H. Baker, president, said demand for the company's products continued in excess of production, but that "some relief is expected when new plants are placed in operation during the last half of the year."

**MIGHTY MIDGET:** Believed to be the smallest jet engine ever built this new Boeing jet engine weighs only 85 lb but develops 150 lb of thrust. Developed after an exhaustive research program, the engine is 29 in. long minus the tail pipe and 22 in. maximum diameter. The tiny turbine wheel is 7½ in. in diameter.





## Report on Visit To Firm's Foreign Plants

Boston

... Milton P. Higgins, president of the Norton Co.; Herbert A. Stanton, vice-president and general manager of the foreign division; and Philip N. Cocke, foreign division manager, recently returned from inspection of company plants in England, France, Germany and Italy.

The company's Welwyn Garden City, Herts, plant just outside London is in reasonably good condition, but wartime day and night operations took a lot out of equipment and workers.

The French plant, near Paris is operating at capacity, and the Italian, near Milan, also is in good condition.

Although the German plant suffered a direct hit during the war, the main manufacturing units are intact and operating on a reduced schedule.

## Whiting Reelects Officers

Harvey, Ill.

... At the meeting of the board of directors of the Whiting Corp., which followed the annual meeting of stockholders, Thomas S. Hammond was reelected chairman of the board and Stevens H. Hammond was reelected president of the company. J. C. Thomas was elected secretary and treasurer and all other officers were reelected to their present positions.

In his report to the shareholders for the year, Stevens H. Hammond reported that shipments amounted to \$11,139,522 for the year ending Apr. 30, 1947. The net profit after taxes was \$340,784, equivalent to \$1.43 per share. This compared with shipments of \$11,931,758 for the previous fiscal year ending Apr. 30, 1946, which was equivalent to 75¢ per share. The corporation ended the fiscal year with a backlog of \$11 million of unfilled orders and reported an improvement in the material situation which was made possible by expanding the subcontracting activities of the company. On July 15 a dividend of 10¢ per share on the common stock of Whiting Corp. was paid to all stockholders of record at the close of business July 1, 1947.

# SAFE

## ...UNDER FOOT



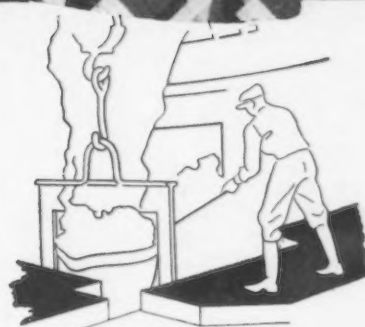
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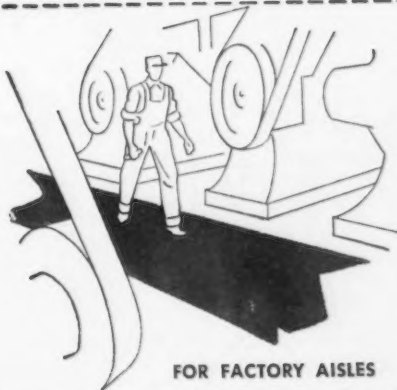
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## Canadian Steel Production and Shipments

Toronto

• • • Canadian production of primary iron and steel shapes for the month of April totaled 277,010 net tons as compared with 282,545 tons produced in March and with 248,987 tons made in April 1946. April output includes 75,474 tons shipped to producers own works for further processing; in March this figure amounted to 68,045 tons and in April 1946 to 47,221 tons. For the month under review production includes 267,166 tons of carbon steel shapes and 9,844 tons of alloy steel shapes.

Shipments of primary iron and steel shapes in April amounted to 206,682 net tons of which 197,334 tons were carbon steel and 9,338 tons alloy steel; in March shipments totaled 216,393 net tons, of which 206,873 tons were carbon steel and 9,520 tons alloy steel and for April 1946, shipments amounting to 201,160 tons of which 195,316 tons were carbon steel and 5,844 tons alloy steel. The above figures which show iron and steel shapers made for sale do not include deliveries to producers for further processing.

For the first 4 months of this year production of primary iron and steel shapes totaled 1,084,622 net tons, whereas shipments, exclusive of producers interchange, which amounted to 261,705 tons, amounted to 839,261 tons which compared with 970,712 tons produced and 802,916 tons shipped, exclusive of producers interchange of 167,508 tons in the corresponding period of 1946. The following table shows production and shipments for sale of primary iron and steel shapes for the month of April in net tons:

April, 1947	Carbon Steel		Alloy Steel	
	Made	Shipped	Made	Shipped
Billets, etc., for forging	7,649	4,601	658	562
Other semifinished shapes, not for re-rolling by makers	33,981	2,077	196	
Structural shapes and piling	12,367	12,835		
Plates	15,910	17,652		
Rails	27,278	30,392		
Tie plates and track material:				
Splice bars	2,505	1,567		
Tie plates	2,062	2,737		
Spikes	1,496	1,335		
Tool steel	121	203	263	274
Concrete reinforcing bars	6,204	5,475		
Hot-rolled bars for cold finishing	490			
Other hot-rolled bars	44,023	40,017	7,349	7,225
Pipes and tubes	13,511	12,080		
Wire rods	22,708	14,458	20	20
Hot-rolled black sheets	20,462	11,565		
Cold reduced black sheets	3,544	3,544		
Galvanized sheets	7,544	7,487		
Steel castings—by ingot makers	1,669	1,662	37	53
by other foundries	4,105	3,736	1,206	1,089
All other shapes, including tin plate, tin mill, black plate, cold finished bars and strips, etc.	39,535	23,921	115	115
<b>TOTAL</b>	<b>267,166</b>	<b>197,344</b>	<b>9,844</b>	<b>9,338</b>

Producers shipments of primary iron and steel shapes, subdivided according to principal consuming industries for the month of April, in net tons follow:

Industry	Carbon Steel	Alloy Steel
Automotive industries	5,832	3,571
Agricultural, including farm machinery	11,214	82
Building construction	21,502	158
Containers industry	9,971	7
Machinery and tools	20,145	462
Merchant trade products	21,992	328
Mining, lumbering, etc.	5,910	464
National defense	11	1
Pressing, forming and stamping	10,761	121
Public works and utilities	873	41
Railway operating	42,263	288
Railway cars and locomotives	14,877	99
Shipbuilding	3,430	38
Miscellaneous and unclassified	858	105
Wholesalers and warehouses	25,921	205
Direct export—to British Empire	1,453	130
to other countries	331	3,240
<b>TOTAL SHIPPED FOR SALE</b>	<b>197,344</b>	<b>9,338</b>
Producers interchange	75,278	196



## Tests Show Tin-Free Can Replace Usual Tin-Containing Solder

Washington

••• Tin-free solder can be used as a replacement for tin containing solder to a limited degree according to results of tests described in one of five reports of war-time solder research now on sale by the Office of Technical Services, Dept. of Commerce. The reports cover experiments and tests to find tin substitutes for use in tin-lead solders.

Two other reports present the results of investigation of industrial uses of tin-free and low-tin solders made by the Battelle Memorial Institute, Columbus, Ohio, under a War Production Board contract. One of the two is a brief survey of the use of solder in the electrical industry.

The fourth report gives details of an investigation made to replace tin in solder with silver. The fifth report gives results of experiments made in studying the properties of modified lead-silver solder as a substitute for tin-lead solders used in the manufacture of small arms ammunition boxes.

### The reports are:

PB-25417—Strategic Metals—Elimination of Tin From Solder; microfilm, \$1; photostat \$1; 2 pp.;

PB-22737 — Investigation of Industrial Uses of Tin-Free and Low-Tin Solder, Part III, Final Report; microfilm, \$1; photostat, \$4; 56 pp., photos, tables;

PB-63566 — Investigation of Industrial Uses of Tin-Free and Low-Tin Solder; Part II—Use of Solder in the Electrical Industry. Final Report; microfilm, \$1; photostat, \$2; 18 pp.; tables;

PB-69119 — Silver Replacement for Tin in Solder; microfilm, \$1; photostat, \$2; 18 pp.;

PB-20509—Solders, Investigation of Substitutes for 70Sn/30 Pb Solder Used on Terne Plate Ammunition Box Liners; microfilm \$.50; photostat, \$2; 20 pp.; diagrams.

Orders for the reports should be addressed to the Office of Technical Services, Dept. of Commerce, Washington 25, and should be accompanied by check or money order.

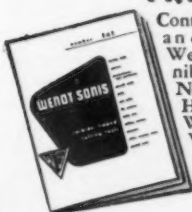


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## PRODUCTION DATA REPORT COUNTERBORES

**WORK PIECE:** Hardened steel sleeve insert in a stationary engine . . . 40 to 42 Rockwell "C".

**OPERATION:** Counterbore — smooth finish.

**COOLANT:** Soluble oil and water.

**MACHINE:** Radial drill.

**TOOLS:** H.S.S. Counterbore.  
Wendt-Sonis Carbide Tipped Counterbore.  
(Straight flute design.) Tool TAC-21.

## COMPARISON

	H.S.S.	WENDT-SONIS
<b>SPEED:</b>	160 r.p.m.	420 r.p.m.
<b>FEED:</b>	.002	.003
<b>RESULTS:</b>	16 pcs. per grind. 114 pcs. per tool average.	57 pcs. per grind. 721 pcs. per tool average.

**WENDT-SONIS**

CARBIDE TIPPED CUTTING TOOLS

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## Four New Standards Specifications Get Army-Navy Approval

Washington

••• The War and Navy Depts. have approved four standards and specifications (THE IRON AGE, May 15, p. 80), the first of a series under the procedures established by the Army-Navy Joint Specifications Board, intended to help solve recurring problems of interest to technical groups.

Those approved are: drawing sizes (JAN-STD-2), abbreviations for use on drawings (JAN-STD-12), welding symbols (JAN-STD-19), and anti-friction bearing identification code (JAN-STD-102).

The JAN-STD-102 supersedes the published Army-Navy Numbering System for anti-friction bearings (NAVSHIPS 250-330) of June 1, 1945; this standard contains basic information from which stock members are determined.

Under development at the moment are a number of joint standards relating to drafting practices, including general drawing practice, format for produc-

tion and construction drawings, dimensioning and tolerancing, screw thread, surface roughness, electrical and electronics symbols, and non-destructive test symbols.

Also under development are the following standards of general interest: welding nomenclature and definitions, welding charts, and color code for compressed gas cylinders and pipelines.

Specifications, which are closely allied with standards, are being developed under a procedure similar to that of the ANJSB and more than 400 joint A-N specifications have been issued under the following heads:

Ordnance items, chemical items, electrical and electronics items, packaging procedures, engineer items, shipboard items, photographic items, and packaging procedures.

During the past year a great deal of progress has been made in the development of joint standards, joint specifications, and a joint numbering system for bearings, a joint Army-Navy report reveals. Aeronautical items and processes are covered by a series A-N specifications and standard drawings.

Also, a series of ANMB (now the Munitions Board) specifications has been issued to describe basic materials currently on its purchase list for stockpiling. For many common items of wide application, federal specifications are being developed, including such items as metals, tools, and varied equipment.

## Final Distribution Statistics Settling All Old Arguments

Pittsburgh

••• The final figures on steel distribution for 1946, as published by the American Iron & Steel Institute (AIS 16) brings finality to the claims of various steel consumers as to how much steel they received.

The charges and countercharges on steel distribution were heard loudest from the automotive industry, various members from time to time charging unfair steel distribution.

As a leading political figure of years passed used to say, "Take a look at the record." The Institute's compilation shows that in 1946 the automotive industry received 43.27 pct of the cold rolled sheet shipments; 24.5 pct of the hot rolled sheet shipments; 25.7 pct of the hot rolled strip and 27.3 pct of the cold rolled strip shipments. Automotive manufacturers received 11.5 pct of all steel shipments without deducting shipments to steel plants for further conversion or 12.5 pct after such deductions.

Passenger car manufacturers received the bulk of the cold rolled sheets, accounting for 26.4 pct; with parts manufacturers getting 13.3 pct; and truck builders getting 3.5 pct. Parts fabricators got the bulk of hot rolled sheets, hot rolled strip and cold rolled strip, with passenger car and truck manufacturers following in that order.

Second only to the automotive industry in cold rolled sheet consumption was the appliance and utensil industry, which received 12.29 pct of the cold rolled sheet shipments. Jobbers and warehouses got 11.1 pct; producers of domestic and commercial equipment such as home and office furniture, toys, signs, hardware, etc.,



BIBLE BATTLE: USWA pickets at the International Edge Tool Co. Plant at Newark, N. J., because they said that owner Quincy Beltram had discharged 11 men for union activity and gave raises only after receiving "messages from the Lord." The union subsequently won an election and presumably the company's twice daily bible classes will be resumed.



got 8.38 pct; and contractors' products accounted for 6.47 pct. Export, which has been a thorn that has bothered many, accounted for only 2.9 pct of the cold rolled sheets and 3.3 pct of the hot rolled sheets. Just slightly over 6 pct of all steel shipments went into export in 1946.

The major consumers of hot rolled sheets, after the automotive industry got its 24.5 pct, were (2) jobbers and warehouses; (3) container manufacturers, including manufacturers of barrels and drums, cans, strapping, and cooperage; (4) steel fabricators for conversion mainly into cold rolled sheets; (5) contractors' products, such as plumbing, heating and air conditioning equipment; (6) industrial, commercial and residential construction; and (7) domestic and commercial equipment.

The automotive industry was also the largest single commercial consumer of hot rolled bars, getting 1,238,463 net tons or 16 pct of the total hot rolled bar shipments in 1946. Hot rolled bars for further conversion and processing accounted for a greater tonnage, 2,086,210 net tons, but final distribution is untraceable. Jobbers and warehouses received 1,026,873 net tons, about 14 pct of the total.

### Surplus Sales Going At Billion A Month

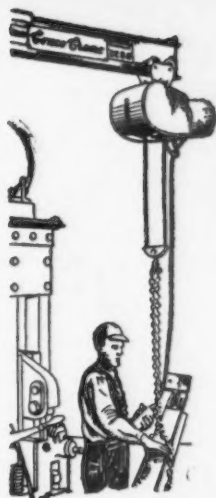
Washington

••• A billion-a-month (original cost) rate of disposal of war surpluses has been maintained throughout the first half of 1947, the June WAA report reveals.

June disposals amounted to \$1.2 billion, the highest total for any month since last September, bringing the total for 1947 to slightly less than \$6 billion.

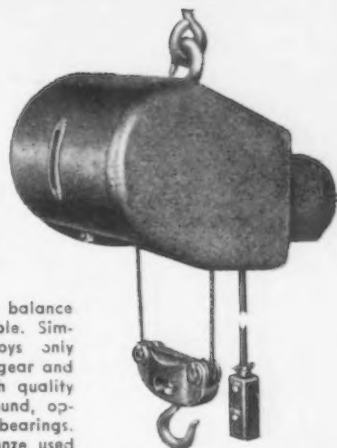
With the cream of the real property skimmed off, the sales in this category have slumped, total sales of \$137 million in June showing a drop of more than \$100 million from May.

A sharp increase in both consumer and producer goods brought June disposal totals for these to about \$388 million. Aircraft disposals for June amounted to \$556 million while aircraft parts worth another \$116 million were sold.



## CONCO TORPEDO ELECTRIC HOISTS

- ★ 250-, 500- and 1000-lb. Capacities.
- ★ Hook, Bolt or Trolley Suspension.
- ★ Positive Electric Brake. Enclosed Limit Switch.
- ★ Push Button Controlled, for Safe, One-Hand Operation.



### TODAY'S TOP VALUE IN HOISTS



Sturdy cast iron double drums balance load, eliminate overlapping cable. Simple, rugged construction employs only two gear reductions—one worm gear and one spur gear. Worm is of high quality steel forging, hardened and ground, operates on Timken radial thrust bearings. Best grade chilled phosphor bronze used for worm gear. Spur gears machined from forged steel blanks with full depth teeth. All gear shafts operate on ball bearings, fully enclosed, in a bath of oil.

The CONCO TORPEDO ELECTRIC HOIST is fast, compact, powerful, easy-to-operate. Double drum construction centers and balances load, assuring an even lift, freedom from sway, greater safety and efficiency for the operator. Write today for detailed specifications and prices. Prompt delivery.

### CONCO ENGINEERING WORKS

15 GROVE STREET

MENDOTA, ILLINOIS

## CASTING OR CARVING?



Usually it's easier, faster, and cheaper to cast metal in the contour of a die than to machine the die out of a solid block.

As for the final result, experience has proved that dies cast of **STRENES METAL** deliver an extraordinary number of stampings between

redressings. The principal reason is that the **STRENES METAL** formula is adapted to the specific job which the die is intended to perform.

We'll be glad to tell you all about **STRENES METAL** cast dies, including actual cases. Write, wire, or phone us.

### THE ADVANCE FOUNDRY CO.

SEMINARY AVE., DAYTON 3, OHIO

*Strenes Metal*

DRAWING AND  
FORMING DIES

## Coal Allocation For Italy Now to Allow Better Steel Output

London

• • • The European Coal Organization has allocated to Italy for the third quarter of the year 1,781,000 metric tons of coal from the U. S., 348,000 from the Ruhr, and 15,000 from Poland, in all 1,955,200 tons. In addition, Italy has secured under bilateral agreements 180,000 tons from Belgium, 70,000 tons from France, 150,000 tons from Poland and 3,000 tons from Turkey. Thus, in the third quarter of 1947, she should be able to count on a total of 2,658,000 tons of foreign coal. With the addition of Italian coal, the million tons per month mark will be approached.

The Italian Ministry of Information and Commerce hopes thereby to bring industrial output up to 80-85 pct of the pre-war level. The allocation of coal to the cement industries has been increased by 50 pct, and that to the engineering trades and the shipyards by 25 pct. The coal allocations to the steel mills are calculated on a basis which should allow of an average output equivalent to 85 pct of the pre-war figure, according to a survey by the Association of Italian Joint Stock Companies.

The nonferrous metal industries will enjoy a 20 pct increase and the coke ovens an 18 pct rise. In view of the larger allocations they have already received, the increase allowed the transport services will not exceed 10 pct. Only small extra quantities have been assigned to the gas works and power stations.

The output of electric power is steadily increasing and is considerably in excess of that for 1946. This has reacted favorably on industrial output. But the shortage of metals and other raw materials remains a stumbling block. In the case of the nonferrous metals, the situation is regarded as serious. Until recently there was a shortage of aluminum and zinc, metals which used to be produced in Italy in quantities adequate to meet home demands. The shortage of aluminum was particularly felt, as it could have been used to replace other nonferrous metals.

The output of zinc will increase rapidly; but the prospects for lead are less favorable, as there is a scarcity of this metal not only in Italy but also abroad. But it is the shortage in the supply of copper which causes most anxiety, as its importation raises also a serious exchange problem. Various efforts have been made to overcome this difficulty by exporting semi-finished and finished copper products

against imports of raw copper and by working on commission for third parties, but so far with little result.

In the engineering trades at present the main difficulty is in securing supplies of ferrous metals, but increased output expected from the steel mills should improve this situation. There is still a lively demand for the products of the engineering trades both on the home and foreign markets, a demand which can only be partially satisfied.

Unless new and unforeseen difficulties arise, the engineering trades in the course of the next four months should be working at 70 pct of capacity. Output of the factories manufacturing typewriters, calculating machines, sewing machines, and bicycles, is proceeding satisfactorily. Conditions are less favorable in the branch producing machine tools, as here foreign competition is keen.

The output of the automobile factories is definitely on the upgrade. In 1946 it rose to 50 pct of the pre-war figure with a production of 28,963 motor vehicles (10,989 passenger cars and 17,934 trucks). This percentage is likely to be considerably exceeded during the current year. In the first three months, 2039 cars were turned out in January, 1895 in February, and 3557 in March.

The price movement continues to be steadily unfavorable, causing serious anxiety to the Government.

The wholesale price index number compiled at the beginning of each month by the Business Statistical Centre on the basis 1938 = 100, rose from 5028 in March to 5194 in April, 5492 in May, and to 6058 in June.

## Machine Tool Congress Program Includes Auto Engineers, Foundrymen

Cleveland

• • • Program of the 1947 Machine Tool Congress, which will be held concurrently with the Machine Tool Show in Chicago, Sept. 17 through 26, has been announced by the National Machine Tool Builders' Assn, sponsor of the event.

Friday, Sept. 19, joint session of the American Society of Tool Engineers and the American



• • •  
LEAP FROG PLANE: Designed for quick take-off and landing, the new Boeing XL-15 makes unusually steep angle climbs. An all-metal airplane designed for use by the Army Ground Forces, the new Boeing will be used for aerial observation, communication and photographic missions. The plane is being tested at Wichita, Kansas.  
• • •



## NEWS OF INDUSTRY

Foundrymen's Assn., Hotel Sherman, Old Town Room; dinner, 6:30; meeting, 8:00 p.m. Presiding, F. J. Schmidt, director of sales, D. A. Stuart Oil Co., Ltd., Chicago. Speaker, Myron S. Curtis, assistant director of engineering, Warner & Swasey Co., Cleveland, "Turning Points in the Metalworking Industry"; speaker, T. E. Eagan, chief metallurgist, Cooper-Bessemer Corp., Grove City, Pa., "When and How to Use Cast Iron."

Monday, Sept. 22, National Electrical Manufacturers Assn., motor generator, industrial control, building wire and cable, rubber sheathed cord and cable, and knife and enclosed switch sections, Palmer House, ballroom, 8:30 p.m. Presiding, R. Stafford Edwards, president, NEMA, and president, Edwards & Co. Speaker, C. S. Kettering, research consultant, General Motors Corp.

### Alcoa Introducing Industrial Roofing

Pittsburgh

••• A new aluminum roofing material for industrial use was recently announced to the building trades by Aluminum Co. of America.

The new product is a heavy-duty specially-formed material, developed for factories, warehouses, storage depots, hangars, and similar structures. Alcoa states that the new industrial roofing will carry heavy loads and meet the exacting requirements of building codes.

Combining high strength, exceptionally high resistance to industrial atmospheres, minimum maintenance and reduced roof load, the roofing will have a covering width of 32 in., allowing for a side lap of 1½ corrugations. It will come in standard 5 through 12 ft. lengths, 0.032 in. thick.

Alcoa also announced that industrial aluminum siding, of the same alloy in lengths as the roofing, is going into production. The siding will have a coverage of 32 in., and will meet code requirements for siding materials. All necessary fittings and accessories such as ridge roll, flashings, rivets, nails and straps will be supplied with roofing and siding.

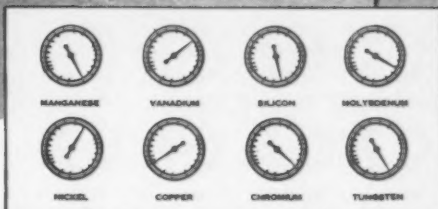
## CUT SPECTROCHEMICAL ANALYSIS TIME

Spectrographic analysis requires

- 4-5 skilled personnel per shift
- from 10 to 30 minutes
- photographic laboratory equipment

### Baird Associates-Dow DIRECT-READING SPECTROMETER

- Completes measurement in 40 seconds,
- Is operated by one technician — without specialized skills,
- Shows concentration percentages directly on large, easily read dials.



Precise analytical determinations are obtained by a single technician, with an accuracy equal to or better than is generally obtained by present photographic methods. Operation of the Baird Associates-Dow Direct-Reading Spectrometer is based on the spectral measurement of the radiation from a spark or arc struck between two electrodes of a sample; individual spectrum lines, in complex iron spectra, are isolated and their intensities measured by electron multiplier phototubes which charge capacitors whose voltage is used to operate dial indicators calibrated in percentage concentration.

### ECONOMY OF TIME

Actual operation for a test requires 20 to 30 seconds followed, automatically, by a 10-second recording interval. Eight meters on the instrument panel simultaneously indicate the percentage concentration of each of the alloy and residual constituents required for your production control.

### ECONOMY OF LABORATORY FACILITIES

Your laboratory staff — relieved of routine production control analyses — can be turned to other important projects.

Other special apparatus produced by Baird Associates, Inc. over the past decade include spectrographs, spectrographic power sources, density balances, infra-red spectrophotometers, microphotometers, infra-red gas analyzers, and Rayleigh interferometers.

Bulletin XXVI giving details of the operating principle, construction, and application of the B-A Direct-Reading Spectrometer will be furnished on request.

**Baird Associates, Inc.**  
INDUSTRIAL PHYSICISTS

39 UNIVERSITY ROAD

CAMBRIDGE 38, MASS.

## European Letter

(CONTINUED FROM PAGE 100)

applied, not to three separate zones with three separate administrative structures, but to a fused allied administration controlling a genuinely unified Western Germany.

But the prime necessity is to render this local diversity effective by superimposing on it unity of command—in other words, by building up in Germany for the "Operation Marshall" a new inter-allied command on the lines of Shaeef. The possibility that General Clay's authority will now be diminished brings nearer the possibility of smooth and easy Anglo-American relations, but the resulting improvement would be only a preliminary. To give the necessary leadership and to convince Europe of

the scale and gravity of the allied purpose, nothing would be more effective than to bring back General Eisenhower, in his new civilian status, to head a new civilian administration.

WITHIN a framework of genuine allied cooperation, the three problems which have so far eluded all solution—the level of German industry, the scale of assistance necessary to reach the new level and the administration, German or otherwise, to run it—could be discussed in an entirely new atmosphere. The administrative solution most earnestly canvassed in America today—the establishment of a Ruhr Authority under international management—is a possible line of approach and the building up of a civilian Shaeef would be a

very useful preliminary action.

The problem of the Ruhr, like so many Allied problems, has reached deadlock because within the present framework of discussion no solution is either economically practicable or politically possible. The situation resembles the terrible wasting stalemate of the winter of 1940.

But the creation of a new framework—in that case Lend-Lease, in this case the Marshall Plan—can, if it is adopted, resolve the lesser problems in the wider approach. The moment for such an initiative has come at the twelfth hour, it is true, yet victory or defeat in the new Battle for Europe depends upon the courage and vision with which this last opportunity is seized.

AMERICAN IRON AND STEEL INSTITUTE  
SHIPMENTS OF STEEL PRODUCTS  
ALL GRADES INCLUDING ALLOY AND STAINLESS  
(Net Tons)

JUNE - 1947

Steel Products	Number of companies	Items	Current Month		To Date This Year		Whole Year 1946				
			Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale)	Per cent of Total Shipments	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale)	Per cent of Total Shipments	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale)	Per cent of Total Shipments			
			(Net Tons)	(Net Tons)	(Net Tons)	(Net Tons)	(Net Tons)	(Net Tons)			
			(Net Tons)	(Net Tons)	(Net Tons)	(Net Tons)	(Net Tons)	(Net Tons)			
Ingots, blooms, billets, tube rounds, sheet and tin bars, etc.	41	1	234,806	4.5	208,771	1,325,962	4.3	1,123,585	1,949,624	4.0	1,645,748
Structural shapes (heavy)	13	2	364,295	6.9	398	2,224,063	7.1	1,807	3,474,284	7.1	5,399
Steel piling	3	3	27,475	0.5	-	160,760	0.5	23	205,313	0.4	141
Plates (sheared and universal)	29	4	563,354	10.7	18,457	3,135,342	10.1	109,260	4,152,181	8.5	250,709
Skelp	6	5	16,119	0.3	31,231	86,274	0.3	195,415	227,033	0.5	194,666
Rails—Standard (over 60 lbs.)	4	6	188,168	3.6	198	1,117,182	3.6	462	1,790,311	3.7	4,890
—All other	5	7	17,112	0.3	-	95,910	0.3	167	144,999	0.3	426
Joint bars	7	8	13,815	0.3	1,337	92,280	0.3	7,559	176,803	0.4	5,327
Tie plates	8	9	46,488	0.9	119	253,871	0.8	2,977	447,496	0.9	18,700
Track spikes	8	10	13,969	0.3	20	89,773	0.3	74	146,194	0.3	693
Hot Rolled Bars—Carbon	33	11	501,060	9.5	64,183	3,166,485	10.2	398,887	5,006,859	10.3	707,991
—Reinforcing—New billet	16	12	109,392	2.0	611	617,246	2.0	4,303	1,048,483	2.1	7,381
—Reinforcing—Rerolled	11	13	13,967	0.3	-	76,848	0.2	-	141,346	0.3	1,267
—Alloy	27	14	126,531	3.0	19,989	912,282	2.9	110,511	1,390,278	2.8	138,395
—TOTAL	45	15	780,950	14.8	84,783	4,772,861	15.3	513,701	7,586,966	15.5	855,024
Cold Finished Bars—Carbon	29	16	116,875	2.2	841	788,953	2.5	4,492	1,316,579	2.7	2,282
—Alloy	26	17	17,961	0.3	192	127,576	0.4	902	196,237	0.4	1,725
—TOTAL	35	18	134,836	2.5	1,033	916,529	2.9	5,394	1,512,816	3.1	4,153
Tool steel bars	19	19	6,586	0.1	522	48,089	0.2	2,750	96,020	0.2	371
Pipe & Tubes—Butt weld	15	20	148,099	2.8	5,341	833,737	2.7	32,624	1,276,289	2.6	45,393
—Lap weld	8	21	30,828	0.6	33	200,488	0.6	658	305,516	0.6	258
—Electric weld	11	22	99,887	1.9	10	499,029	1.6	990	674,459	1.4	591
—Seamless	10	23	178,030	3.4	12,543	1,048,559	3.4	73,846	1,871,540	3.8	83,441
—Conduit	7	24	13,500	0.2	855	70,278	0.2	4,299	98,521	0.2	2,448
—Mechanical and pressure tubing	13	25	56,670	1.1	1,644	329,136	1.0	10,294	429,180	0.9	3,478
Wire rods	23	26	59,220	1.1	27,436	330,516	1.1	162,465	679,998	1.4	346,506
Wire—Drawn	38	27	218,954	4.2	14,960	1,289,427	4.1	91,342	1,935,124	4.0	135,592
—Nails and staples	18	28	63,532	1.2	276	427,480	1.4	4,110	636,632	1.3	797
—Barbed and twisted	15	29	21,081	0.4	11	125,148	0.4	24	207,610	0.4	-
—Woven wire fence	13	30	33,207	0.6	246	208,779	0.7	1,874	383,230	0.8	-
—Bale ties	12	31	10,721	0.2	-	62,096	0.2	-	99,993	0.2	-
Black Plate—Ordinary	9	32	62,710	1.2	205	414,082	1.3	1,442	781,167	1.6	3,179
—Chemically treated	8	33	661	-	-	14,822	0.1	-	125,170	0.3	-
Tin and Terne Plate—Hot dipped	9	34	167,069	3.2	-	967,251	3.1	228	1,924,657	3.9	-
—Electrolytic	9	35	140,931	2.7	-	733,781	2.3	529	909,173	1.9	-
Sheets—Hot rolled	30	36	582,030	11.1	45,551	3,574,699	11.5	296,270	5,521,463	11.3	421,198
—Cold rolled	17	37	460,980	8.7	2,340	2,687,427	8.6	12,613	4,075,554	8.4	3,397
—Galvanized	16	38	130,542	2.5	3	791,802	2.5	192	1,462,053	3.0	1,725
—Electrical and enameling	10	39	51,122	1.0	-	285,594	0.9	307	435,170	0.9	-
Strip—Hot rolled	23	40	141,121	2.7	19,654	868,706	2.8	144,958	1,363,812	2.8	257,176
—Cold rolled	34	41	138,125	2.6	1,506	813,064	2.6	14,426	1,282,146	2.6	25,904
Wheels (car, rolled steel)	5	42	31,055	0.6	-	187,332	0.6	2	252,308	0.5	348
Axles	5	43	15,663	0.3	-	90,028	0.3	53	130,461	0.3	221
All other	-	44	-	-	-	-	-	-	6,266	-	-
TOTAL STEEL PRODUCTS	141	45	5,263,711	100.0	479,463	31,172,157	100.0	2,816,720	48,775,532	100.0	4,297,889

During 1946 the companies included above represented 99.5% of the total output of finished rolled steel products as reported to the American Iron and Steel Institute.

\* Adjusted.



## AMERICAN IRON AND STEEL INSTITUTE

## Production of Open Hearth, Bessemer and Electric Steel Ingots and Steel for Castings

## YEAR 1946

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		*Calculated weekly production, all companies (Net tons)	Number of weeks in month
	*Net tons	Percent of capacity	Net tons	Percent of capacity	*Net tons	*Percent of capacity	*Net tons	Percent of capacity		
January.....	3,530,192	51.1	207,512	47.4	135,183	28.9	3,872,887	49.6	874,241	4.43
February.....	1,301,719	20.9	25,905	6.6	65,058	15.4	1,392,682	19.8	348,171	4.00
March.....	5,950,241	86.2	363,949	83.1	194,574	41.6	6,508,764	83.3	1,469,247	4.43
1st Quarter.....	10,782,152	53.8	597,366	47.0	394,815	29.1	11,774,333	51.9	915,578	12.86
April.....	5,336,317	79.8	286,088	67.5	238,790	52.8	5,861,195	77.5	1,366,246	4.29
May.....	3,702,184	53.6	153,409	35.0	217,027	46.4	4,072,620	52.2	919,327	4.43
June.....	5,148,660	77.0	251,253	59.2	225,860	49.9	5,625,773	74.4	1,311,369	4.29
2nd Quarter.....	14,187,161	69.9	690,750	53.7	681,677	49.7	15,559,588	67.9	1,195,971	13.01
1st 6 months.....	24,969,313	61.9	1,288,116	50.4	1,076,492	39.4	27,333,921	59.9	1,056,588	25.87
July.....	6,027,388	87.5	365,332	83.6	225,963	48.5	6,618,683	84.9	1,497,440	4.42
August.....	6,291,363	91.1	373,837	85.4	259,322	55.5	6,924,522	88.7	1,563,098	4.43
September.....	5,951,232	89.2	371,465	87.8	232,869	51.6	6,555,566	86.9	1,531,674	4.28
3rd Quarter.....	18,269,983	89.3	1,110,634	85.6	718,154	51.8	20,098,771	86.8	1,530,752	13.13
9 months.....	43,239,296	71.1	2,398,750	62.2	1,794,646	43.6	47,432,692	69.0	1,216,223	39.00
October.....	6,312,604	91.4	387,933	88.6	251,205	53.8	6,951,742	89.0	1,569,242	4.43
November.....	5,873,264	87.8	318,350	75.1	266,157	58.8	6,457,771	85.4	1,505,308	4.29
December.....	5,286,799	76.7	222,704	51.0	250,998	53.8	5,760,501	73.9	1,303,281	4.42
4th Quarter.....	17,472,667	85.3	928,987	71.5	768,360	55.4	19,170,014	82.8	1,458,905	13.14
2nd 6 months.....	35,742,650	87.3	2,039,621	78.5	1,486,514	53.6	39,268,785	84.8	1,494,815	26.27
Total.....	60,711,963	74.7	3,327,737	64.6	2,563,006	46.6	66,602,706	72.5	1,277,382	52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,558,041 net tons open hearth, 98,849 net tons Bessemer and 105,491 net tons electric ingots and steel for castings, total 1,762,381 net tons; based on annual capacities as of January 1, 1946 as follows: Open hearth 81,236,250 net tons, Bessemer 5,154,000 net tons, Electric 5,500,290 net tons, total 91,890,540 net tons.

\* Revised January through December, 1946.

## YEAR 1947

(Preliminary)

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production, all companies (Net tons)	Number of weeks in month
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
January.....	6,544,841	95.1	384,096	87.7	284,309	65.9	7,213,246	93.0	1,628,272	4.43
February.....	5,830,371	93.8	314,912	79.6	276,779	71.1	6,422,062	91.7	1,605,515	4.00
March.....	6,614,369	96.1	378,893	86.5	314,224	72.9	7,307,486	94.3	1,649,545	4.43
1st Quarter.....	18,989,581	95.0	1,077,901	84.8	875,312	69.9	20,942,794	93.1	1,628,522	12.86
April.....	*6,360,600	95.4	375,675	88.6	*306,422	*73.4	*7,042,697	93.8	*1,641,654	4.29
May.....	6,634,716	96.4	372,878	85.2	321,903	74.6	7,329,497	94.5	1,654,514	4.43
* June.....	6,312,674	94.7	351,247	82.8	304,744	73.0	6,968,665	92.8	1,624,397	4.29
* 2nd Quarter.....	19,307,990	95.5	1,099,800	85.5	933,069	73.7	21,340,859	93.7	1,640,343	13.01
* 1st 6 Months.....	38,297,571	95.3	2,177,701	85.2	1,808,381	71.8	42,283,653	93.4	1,634,467	25.87
† July.....	6,033,408	87.9	256,125	58.6	282,652	65.7	6,572,185	85.0	1,486,920	4.42
August.....										4.43
September.....										4.28
3rd Quarter.....										13.13
9 months.....										39.00
October.....										4.43
November.....										4.29
December.....										4.42
4th Quarter.....										13.14
2nd 6 months.....										26.27
Total.....										52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,553,721 net tons open hearth, 98,849 net tons Bessemer and 97,358 net tons electric ingots and steel for castings, total 1,749,928 net tons; based on annual capacities as of January 1, 1947 as follows: Open hearth 81,010,990 net tons, Bessemer 5,154,000 net tons, Electric 5,076,240 net tons, total 91,241,230 net tons.

\* Revised

† Preliminary figures, subject to revision.

## ASME Elects Marshall As Honorary Member

New York

• • • Secretary of State George C. Marshall has been elected to honorary membership in The American Society of Mechanical Engineers, it was announced by Clarence E. Davies, secretary of the society.

In a letter to Eugene W. O'Brien, of Atlanta, president of the engineering society, Secretary Marshall formally accepted the honor and said that if his other commitments allow, he will attend the annual dinner, to be given on the evening of Dec. 3 in Atlantic City, to accept the award in person.

Henry Ford II, president of the Ford Motor Co., Detroit, will be the speaker at the dinner. His subject has tentatively been announced as: "Greater Production for Peace." The dinner will feature the 68th annual meeting of the society, Dec. 1-5, in Atlantic City.

Three others have been named to receive honorary memberships at that time. They are: Dr. Harvey N. Davis, president of Stevens Institute of Technology, a past president of the ASME, formerly director of the office of produc-

tion research and development of the War Production Board; Francis Hodgkinson of New York, retired consulting engineer, who was connected with the Westinghouse Electric Corp. from 1896 until 1936, a former vice-president of the ASME and its Holley Medalist in 1938; Everett G. Ackart of Wilmington, Del., retired, formerly chief engineer of E. I. du Pont de Nemours & Co., Wilmington, and Lord Dudley Gordon, president of the British Institution of Mechanical Engineers, and noted English authority on refrigeration, received a similar honor earlier this year in London.

Medals and prizes for 1947, to be conferred at the annual meeting: The ASME Medal, highest honor of the engineering society, to Paul W. Kiefer of New York, chief engineer, motive power and rolling stock, New York Central R.R.; Holley Medal to Raymond D. Johnson, hydraulic engineer, retired, Fort Lauderdale, Fla.; Worcester Reed Warner Medal to Arpad L. Nadai, consulting engineer, Westinghouse Research Laboratories, East Pittsburgh; Melville Prize Medal to Raymond C. Martinelli of the general engineering and construction laboratory, General Electric Co., Schenectady, for an original paper on "Heat Transfer to Molten Metals."

## Steel Price Situation

(CONTINUED FROM PAGE 109)

mand will fall to the point where costs are being made and at least "some" profit. Yet under continual and close questioning steel heads say that recent price increases with few exceptions were not too much.

Some say they were too little. On specialty items where the U. S. Steel Corp. posted a lower price (long ternes, enameling sheets and galvanized sheets) it won't be long until this is the ruling price. The same applies to semifinished steels. This will happen, say steel men privately, because among the major firms there cannot be two prices if long established customer relations are to be retained.

The final answer according to sales officials is that present earnings are good because of (1) high demand, (2) high operations, (3) good prices, (4) selectivity of output, (5) fair inventory position. Future earnings will not be good if (1) demand falls off sharply, (2) price cutting breaks out, (3) freight rates are advanced, (4) firms have to go into distant territory to get business (freight absorption), (5) scrap prices stay high in relation to pre-war prices and (6) if steel labor asks for and receives higher wages next year. If the wage-price spiral should continue in order to insure present steel earnings, the ultimate, according to oldtimers in the industry, is an eventual shock which will make the 1931-35 one look like a Sunday school picnic.

## June Strikes Total 350

Washington

• • • Work stoppages were noticeably fewer in June than in either of the two preceding months, according to the Bureau of Labor Statistics. BLS reports that 350 new strikes (involving six or more workers for one day or more were recorded in June against 388 a year ago. Direct idleness in June amounted to 3,750,000 man-days as against 5,700,000 in May. The Conciliation Service assisted in ending 261 disputes during the month.

### Coming Events

- Aug. 22-23 Institute of Scrap Iron & Steel, midyear meeting, French Lick, Ind.
- Aug. 25-29 National Assn. of Power Engineers, Inc., Boston.
- Sept. 1-4 American Society of Mechanical Engineers, fall meeting, Salt Lake City.
- Sept. 8-12 Instrument Society of America, conference, Chicago.
- Sept. 10-12 Porcelain Enamel Institute, ninth annual forum, Columbus, Ohio.
- Sept. 17-26 National Machine Tool Builders' Assn., machine tool show, Dodge-Chicago Plant, Chicago.
- Sept. 18-20 Foundry Equipment Manufacturers Assn., annual meeting, Hot Springs, Va.
- Sept. 18-20 National Assn. of Foremen, annual convention, Los Angeles.
- Sept. 22-25 Assn. of Iron & Steel Engineers, annual meeting, Pittsburgh.
- Sept. 29-Oct. 3 American Gas Assn., San Francisco.
- Oct. 2-3 Gray Iron Founders' Society, annual convention, Milwaukee.
- Oct. 6-7 Packaging Machinery Manufacturers Institute, annual meeting, Springfield.
- Oct. 9-10 Porcelain Enamel Institute, annual meeting, Cleveland.
- Oct. 16-17 National Conference on Industrial Hydraulics (formerly Hydraulics Machinery Conference), annual meeting, Chicago.
- Oct. 18-24 National Metal Exposition, Chicago.
- Oct. 30-Nov. 1 American Society of Tool Engineers, semiannual meeting, Boston.
- Oct. 31 Illinois Mining Institute, annual meeting, Springfield, Ill.
- Nov. 7-8 Annual Conference on X-Ray and Electron Diffraction, Mellon Institute of Industrial Research, Pittsburgh.



## Weekly Gallup Polls . . .

### Voters Think Russia is Out to Dominate the World

Princeton, N. J.

••• On the second anniversary of the atom bomb, mistrust of the motives of Russia and to some extent of the United States is prevalent throughout the western world, according to George Gallup, director, American Institute of Public Opinion.

An international poll just completed in six nations—England, France, Canada, Norway, Holland and the United States—finds a widespread feeling among the common people that certain big nations are out to try to dominate the world. Russia is named most frequently as the chief offender in this respect, although the United States also comes in for a good deal of censure in France, Holland and England.

To the homes of everyday folks in the six nations went public opinion poll reporters conducting the international survey. They asked two questions. The first was:

"Do you believe any nation or nations would like to dominate or run the world?"

The vote in the various countries follows:

	Yes Pct	No Pct	No Opin. Pct
U. S. A. . . . .	71	19	10
England . . . . .	64	21	15
France . . . . .	78	6	16
Canada . . . . .	71	12	17
Holland . . . . .	84	6	10
Norway . . . . .	52	16	32

The second question asked:

"Which country or countries?"

The results may be summarized as follows:

In the United States, more than three-fourths named Russia with other answers scattered among Germany, England, Japan and the United States itself.

In England, too, Russia was named by a large majority, but approximately one-third named the United States as out to dominate the world.

In France and in Holland, Russia was named most frequently but the United States was a fairly close second.

Among the Norwegians, the

largest number blamed Russia but nearly half said that both Russia and the United States are trying to dominate.

In Canada, more than three-fourths singled out Russia, with the United States and England next.

••• Fear of a third world war continued widespread throughout the United States but it has not increased appreciably since the East-West split in Europe.

More than half the voters think there will be another major war within 10 years. Three out of every four believe it will certainly come within 25 years.

That outlook is gloomy enough. But it is no more gloomy than last April. Fear of war then was just about as high. Since April there have been fresh disagreements between Russia and the Western powers, but they apparently did not add greatly to the war jitters.

At regular intervals since early 1945 the institute has conducted surveys to measure the public's fear of war. The results, forming a kind of war fever chart, are shown below. Two questions were put to separate but comparable cross-sections of voters, as follows:

(1) "Do you think the United States will find itself in another war within, say, the next 10 years?"

(2) "Do you think the United States will find itself in another war within, say, the next 25 years?"

The results:

#### WAR IN 10 YEARS?

	Yes Pct	No Pct	No Opin. Pct
Mar. 1946 . . . . .	49	38	13
Apr. 1947 . . . . .	50	38	12
Today . . . . .	53	36	11

#### WAR IN 25 YEARS?

	Yes Pct	No Pct	No Opin. Pct
Mar. 1945 . . . . .	38	45	17
Aug. 1945 . . . . .	40	48	12
Oct. 1945 . . . . .	54	28	18
Feb. 1946 . . . . .	59	22	19
Mar. 1946 . . . . .	69	19	12
Aug. 1946 . . . . .	65	16	19
Apr. 1947 . . . . .	73	18	9
Today . . . . .	73	18	9

### Fear of Third World War In 10 to 25 Years Found to Be Prevalent in United States

The trend of sentiment is of considerable historical interest because it shows that disillusionment set in very quickly after the end of World War II.

The European conflict ended in May 1945 and the Japanese war in August. Within 2 months the institute was finding a majority believing in the likelihood of war in 25 years, and within 7 months, in March 1946, nearly one-half of the voters (49 pct) believed another war was coming inside 10 years.

The change in attitude was due primarily to a change in our thinking about Russia. When the war ended there was widespread feeling that the United States and Russia could get along together and, between them, work out a lasting peace for the world.

But as the months slipped by, the average American began to feel that Russia did not want to cooperate with us, and that she was determined to rule over large hunks of Europe and even perhaps try to dominate the world. Believing this, the American voters became more and more convinced that the world has by no means seen the last major wars.

One interesting aspect of the situation today is that fear of war is greater among young people than among older voters.

Opinions by age on the likelihood of another war within 10 years are as follows:

#### WAR IN 10 YEARS?

	Yes Pct	No Pct	No Opin. Pct
Age 21-29 . . . . .	56	36	8
30-49 . . . . .	55	34	11
50 & over . . . . .	49	39	12

## Canadian Steel Firms Seek Price Aid; '47-'48 Subsidy Is \$10 Million

Toronto

• • • With the recent advance in steel prices in the United States, and soaring production costs in this country, Canadian steelmakers have hopes that something will be done to lift ceiling prices in Canada. While official Ottawa has given no intimation of an increase in steel prices, it is thought that some action in this direction may be taken when C. D. Howe, Minister of Reconstruction, returns from Britain later this month.

According to information obtain from reliable sources, Canada will pay upwards of \$10 million to subsidize steel production during 1947 and 1948. Of this total about \$7.2 million will go to Dominion Steel & Coal Co., Sydney, N. S., under terms of an agreement entered into Feb. 14, 1947, and Algoma Steel Corp., Sault Ste. Marie, will receive \$1.6 million under a similar arrangement, while the greater part of the remainder includes \$1 million for imported steel scrap and \$320,000 for transporting steel scrap from Western Canada to eastern consuming points.

The bonus to Dominion Steel &

Coal Co. is at the rate of \$12 per ton on steel ingots produced for consumption in the domestic markets. This agreement was dated Feb. 14, 1947, but was retroactive to Jan. 1, 1946, and the rate of subsidy from Jan. 1, 1946 to Dec. 31, 1946 was \$11 per ton, with the \$12 rate becoming effective at the end of that year, and is to remain in effect "during such period as directions regarding production are given to the company by or on behalf of His Majesty." If the Crown would terminate the deal the company is to receive 60 days notice.

The subsidy to Algoma Steel Corp. is at the rate of \$2 per ton for an annual tonnage estimated at 805,000 tons. Estimated tonnages for 1947 fiscal year follow: April, May and June, 60,000 tons a month; July, 65,000 tons, and August to the end of the government year, Mar. 31, 1948, 70,000 tons a month. The Government to give 45 days' notice in terminating the arrangement.

Burlington Steel Co., Hamilton, which also is included in the subsidy agreement, receives \$10 per ton to permit it to purchase rails of rerolling quality to enable the company to maintain maximum production at its mill.

Under the arrangement it is estimated that a movement of 40,-

000 tons of steel will be made from Western Canada at \$8 per ton, while the cost of 100,000 tons of imported scrap is placed at \$10 per ton. Imported scrap is to be brought from the United States and abroad, including the Far East. Other smaller amounts are listed as a subsidy to pay freight rates to move ingots, slabs and billets from Algoma Steel and Dominion Steel, representing in excess of \$1.5 million. The Government also will pay Dominion Foundry & Steel, Ltd., Hamilton, at a rate of \$11.10 per ton, which will include a \$6.10 freight rate in shipments from Sydney.

In addition the sum of \$200,000 has been set aside for subsidizing agricultural implement companies to the extent of increased cost of castings, resulting from increased pig iron prices. This is to remain in effect as long as ceiling prices continue on farm implements.

## Railroads to Set Up Reserve Units Under Mobilization Program

Washington

• • • Agreements have already been signed by the railroad industry for organization of 11 reserve units under the Affiliation Program of the War Dept. for industrial mobilization, it is reported by Maj. Gen. Edmond H. Leavey, chief of transportation.

Units to be created are one each in Chicago, New York and Washington by the Assn. of American Railroads; one in Minneapolis and another in Milwaukee by the Milwaukee Railroad; one each in Memphis and Chicago by the Illinois Central; one each in Little Rock and Des Moines by the Rock Island; one in Atlanta and another in Birmingham by the Southern Railway; one in Little Rock by the Missouri Pacific, and one in Springfield, Mo., by the Frisco Lines.

At the same time, the Army's transportation chief said that the trucking industry has promised full support to the program (THE IRON AGE, July 31, 1947, p. 72) and is engaged in plans for organizing units in the near future. The International Teamsters' union has thrown wholehearted support behind the program for the trucking industry, General Leavey said.

**RAILROADS IN RESERVE:** The first transportation group to join the recently formed Organized Reserve Corps was the Assn. of American Railroads. Present at the ceremony were, left to right, James H. Aydelott, vice-president of AAR; W. T. Faricy, president; and Brig. Gen. P. S. Yount, of the War Dept. Transportation Corps.





## Porcelain Enamellers Throw Conference Open to All Interested

### Washington

••• The Porcelain Enamel Institute Ninth Annual Forum, to be held Sept. 10 to 12 at Ohio State University, Columbus, Ohio, is open to all individuals connected with or interested in the porcelain enameling industry.

The subjects to be discussed at the forum this year will concern operating and technical problems which face the industry. The program has been based on the returns of a special questionnaire designed to determine what topics deserve discussion.

Registration fees will be \$10.00 for the three-day session, \$7.50 for two days, and \$5.00 for one day. Dinner reservations will be accepted at the same time.

On Wednesday morning, September 10, registration will be followed by a visit to the University's Department of Ceramic Engineering and meetings of the forum committees. Presiding at the Wednesday afternoon session will be R. M. King, Professor of Ceramic Engineering, Ohio State University. Dean C. E. Macquigg, also of the university, will officially welcome the forum and Richard H. Turk, president, Porcelain Enamel Institute, will respond in the name of the institute.

Speakers will be J. E. Hansen,

### Five Technical Meetings Are Program of Ninth Yearly Institute Meeting

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Ferro Enamel Corp., who will discuss "How to Choose the Correct Type of Porcelain Enamel for Specific Applications," and A. C. Francisco, P.E.I. research fellow, National Bureau of Standards, whose subject will be "Demonstration and Discussion of Apparatus for Evaluation of Adherence."

F. A. Petersen, special research associate, and Professor of Ceramic Engineering, University of Illinois, will preside at the Thursday morning session when a panel discussion will be held on the subject, "Different Systems of Metal Surface Preparation."

Members of the panel and their topics of discussion will be as follows: H. C. Ellinger, Philco Corp.—"Spray Pickling"; A. M. Langbein, American Stove Co.—"Conventional Pickle Practice"; A. R. Mallonn, Republic Stamping & Enameling Co.—"Bright Annealing"; and George Tuttle, Benjamin Electric Mfg. Co.—"Spray Cleaning, Pickle, Etc."

Frank E. Hodek, Jr., General Porcelain Enameling and Mfg. Co.,

will preside at the Thursday afternoon session, during which "Fuel Oils" will be discussed by William Jones, The North American Mfg. Co.; "Use of Liquefied Petroleum Gas" by E. A. Jamison, Phillips Petroleum Co.; "Pyrometry and its Application in Porcelain Enameling Plants" by John Green, Boran Instrument Co.; and "Immersion Heating Application" by S. E. Shephard, North American Mfg. Co.

On Thursday evening the annual forum banquet will be held. Thurman Miller will be the banquet speaker.

Friday morning will find J. B. Simons, Westinghouse Electric Corp., presiding. Topics to be discussed at this session will be "Importance of Selection of Proper Personnel" by Dr. Perry L. Rohrer, Rohrer, Hibler & Replogle and "Employee Training" by Edward Arter, Curtiss Wright Corp.

Presiding at the Friday afternoon session will be F. H. Guthrie, Newark Stove Co. J. M. Schappert, National Metal Trades Assn., will address the meeting on "Job Evaluation and Wage Incentives" and E. H. Smedley, Stevenson, Jordan & Harrison, Inc., will discuss "Production Planning."

Following the Friday afternoon session the forum will be adjourned.

## New Licenses Needed For Fourth Quarter Iron & Steel Exports

### Washington

••• Exports of certain iron and steel products will be subject to individual licensing procedure beginning Oct. 1, the Commerce Dept. announced last week. Office of International Trade officials said the move is designed to "allow for a closer screening of the end uses of the steel to be exported, and to provide for a more equitable distribution among foreign countries."

Approximately 50 steel mill products will be affected by the change in export licensing procedure. The move represents a marked departure from the present practice of permitting exports

under consolidated licenses issued by OIT. Under consolidated licensing, exporters may ship licensed quantities of steel products to any country except occupied countries and certain other areas.

Under the individual licensing procedure which takes effect Oct. 1, exporters must apply separately for each item for export, stating names of consignees, countries of destination and end uses to which the products are to be put.

Commerce Dept. officials explain that consolidated licenses are issued within a total export quota which the U. S. Government determines may be exported without endangering the domestic economy, but without regard to distribution among foreign countries. Under the individual licensing system, country quotas based

on relative need are established with the total to be authorized for export.

OIT said that fourth quarter quotas for iron and steel products, now in preparation, will not "depart markedly from the present method of distribution."

## Raise Alloy Tubing Price

### Beaver Falls, Pa.

••• Babcock and Wilcox Tube Co. announced the following increases in base prices of seamless alloy pressure tubing: Schedule B-1, carbon, 1/2 pct, and including 3 pct chrome-molybdenum, a 6 pct increase in price. Schedule B-3, SAE alloy pressure tubing, 7 pct increase. Alloy mechanical tubing schedule J, 7 pct increase. These increases are effective with shipments of Aug. 4, 1947.

## Industrial Briefs . . .

• **NEW REFRACTORIES KILN** — Enlargement of its processing facilities by the addition of a new refractories kiln at its Maple Grove, Ohio, plant, has been announced by Basic Refractories, Inc., of Cleveland. The new rotary kiln, now under construction, is equipped with a steel stack 125 ft high and 12 ft 6 in. in diam, the largest ever built by the Patterson-Leitch Co., of Cleveland. The kiln also contains the largest hood ever built by the Allis-Chalmers Corp.

• **FACTORY BRANCH**—The H. M. Harper Co., Chicago, manufacturers of fastenings, bolts, nuts and screws, made from nonferrous and stainless steel alloys, has opened a factory branch office at 17600 Detroit Ave., Cleveland. Earl A. Channer, former Chicago district head and New York branch manager for the Harper organization, has been appointed manager of the new office.

• **MERGER**—Indian Motorcycle is to merge with R. B. Rogers Cos., Inc., New York, under the name of Indian Motorcycle Co. Prior to the merger, Rogers and the Atlas Corp. controlled about 70 pct on Indian common stock.

• **NEW PUBLICITY FIRM**—A new and specialized firm in the publicity field, Harry W. Smith, Inc., 480 Lexington Ave., New York, has been formed to produce, exclusively, technical material addressed to commercial, industrial and engineering audiences. It will work direct with industrial firms, or with advertising agents and public relations organizations short on engineering editorial talent.

• **CHEMICALS AND PLASTICS** — Catalog CG-71-1274 listing 89 items for sale by WAA is available at the Customer Service Centers in Chicago and Milwaukee. The chemicals and plastics costing the government more than \$75,000 will be available to priority holders until Aug. 19

and sales to commercial channels will be opened Aug. 25 through Aug. 29.

• **INCREASES FURNACE CAPACITY** —The strip annealing capacity at the Indiana Harbor, Ind., mill of The Youngstown Sheet & Tube Co., will be increased when 12 annealing furnaces are remodeled by Rust Furnace Co., Pittsburgh.

• **ACQUISITION**—Announcement has been made by Progressive Welder Co., Detroit, of the acquisition of the Warren Alloy & Machine Co. of Warren and Detroit, Mich. Warren Alloy & Machine Co. has been operating a nonferrous foundry in Warren and a jig, fixture, die, gage and punching unit plant in Detroit. Both plants will be operated as a separate division of Progressive Welder Co. under the name of Warren Alloy & Machine Div.

• **COMPANY EXPANDS** — A new and modern warehouse and office building has been erected in Providence by Chase Brass & Copper Co. and is now in full operation at its new location, 66 Branch Ave.

• **MORE SPRINGS**—Great Lakes Spring Corp. in Chicago will soon start construction of a warehouse addition to its factory which will contain 40,000 sq ft of floor area. The main plant of this company is less than 2 years old and was constructed under a special wartime program permitting the automotive industry to get ready for peacetime production. The company's chief product is automobile seat cushion springs.

• **ACQUIRES STOCK** — Fansteel Metallurgical Corp., North Chicago, Ill., has acquired all the outstanding stock of the Weiger-Weed Co., Detroit, manufacturers of refractory alloys, resistance welding dies, and welding fixtures. It will continue in Detroit under its own name as a Fansteel division.

## Firms Get Contracts For \$82 Million On Greek Aid Program

• • • Six American steel and construction firms have been awarded contracts totalling \$82,400,000 for Greek rehabilitation, the State Dept. announced last week.

The six firms, whose contracts will be placed into operation under the American Mission for Aid to Greece, are Johnson, Drake & Piper, Inc., of New York; Guy F. Atkinson, Inc., of San Francisco; Starr, Park & Freeman, Inc., of New York; Grove, Shepherd, Wilson & Kruge, Inc., of New York; J. Rich Steers, Inc., of New York, and U. S. Steel Corp.

The contracts cover construction and rehabilitation of Greek highways, railroads, bridges and ports. An advance party of American contractors, left for Athens by air last week to supervise placing of the contracts into operation. Members of the advance party include Col. D. W. Griffiths, Wilfred Painter, B. A. Byrnes and Earl Jennett. A second group is expected to leave next week.

Due to the "unusual nature of the work contemplated," contracts were not let on a bid basis, the State Dept. explained. The award of contracts was determined on the basis of experience by the companies in projects outside the U. S., personnel and equipment available, and past performance on Government contracts, the department said.

Amounts are as follows:

Johnson, Drake & Piper; Guy F. Atkinson, and Starr, Park & Freeman: \$64,000,000 for rehabilitation and reconstruction of railroads, highways and bridges.

Grove, Shepherd, Wilson & Kruge and J. Rich Steers: \$17,500,000 for reconstruction of three Greek ports and clearance of the Corinth Canal.

U. S. Steel: \$900,000 for fabrication of steel for 14 bridges.

"Restoration of the Greek highway system presents the most difficult single public reconstruction problem," the State Dept. said. "Bridges and culverts were destroyed by the military forces and for the last seven years Greece's 9,000 miles of roads have been used by heavy-duty traffic with only slight maintenance."



## Construction Steel . . .

• • • Fabricated steel awards this week included the following:

- 1000 Tons, Orange, Tex., E. I. duPont de Nemours & Co., to Virginia Bridge Co., Roanoke, Va.
- 570 Tons, Chicago, North State St. viaduct to Bethlehem Steel Co., Bethlehem.
- 550 Tons, State of Nebraska, bridges FAP F194-2, FAP, S219-1, FAP, F454-1 to Omaha Steel Works, Omaha, Neb.
- 500 Tons, Agricola, Fla., acid plant for Swift & Co. to Virginia Bridge Co., Roanoke, Va.
- 200 Tons, Newark, N. J., bridge over Wilson Ave. and Niagara St., New Jersey Dept. of Highways, Koline Construction Co., to Bethlehem Steel Co., Bethlehem.
- 160 Tons, Cloquet, Minn., pulp building for Wood Conversion Co. to St. Paul Foundry Co., St. Paul.
- 160 Tons, San Gabriel, Calif., office building for Pacific Telephone & Telegraph Co., through Joshua H. Marks Co. to Consolidated Steel Corp., Los Angeles.
- 100 Tons, San Bernardino County, Calif., tainter gate and hoist at Lytle Creek channel intake, Los Angeles District Corps of Engineers, to Consolidated Steel Corp., Los Angeles.

• • • Fabricated steel inquiries this week included the following:

- 1300 Tons, State of Kansas, Santa Fe R. R. beam spans.

### Crucible Awards Coke And Byproducts Plant Contract to Koppers

Pittsburgh

• • • Crucible Steel Co. of America has awarded Koppers Co., Inc., a contract for construction of new coke and by-product facilities at its Midland, Pa., plant at a price in excess of \$6,000,000.

A battery of 63 coke ovens, coal and coke handling equipment, by-product facilities, and a gas holder are included in the project, according to a statement by W. H. Colvin, Jr., president of Crucible Steel, and Joseph Becker, vice president and general manager of Koppers Engineering & Construction Division.

The new coke ovens will add 600 tons daily to the Midland output of blast furnace coke, bringing the total output to 1800 tons, Mr. Colvin said. He stated that the new facilities are expected to be in operation by October, 1948.

Mr. Becker said that the battery of ovens will be of the Koppers-Becker type. In addition, the present Crucible ammonia recovery system will be completely modernized by the installation of two Koppers ammonium sulphate satu-

1300 Tons, Toledo, improvements to the New York Central passenger station.

800 Tons, Forest Park, Ill., housing project, American Community Builders.

700 Tons, Milwaukee, building addition for Miller Brewing Co.

380 Tons, Mendocino County, Calif., bridge at Navarro River, near Albion, California Div. of Highways, Sacramento, bids to Sept. 3.

200 Tons, Chester County, Pa., City of Chester, Pine Grove Dam, due Aug. 21.

170 Tons, Buffalo, National Aniline Div., Allied Chemical & Dye Corp., addition to power plant, bids in.

• • • Reinforcing bar inquiries this week included the following:

145 Tons, Tomah, Wis., sewage treatment plant, bids closed Aug. 8.

130 Tons, Port Washington, Wis., filtration plant, bids closed Aug. 6.

• • • Railroad car awards this week included the following:

American Car & Foundry Co., New York, has received the following orders for freight car equipment: Chicago & Eastern Illinois R. R. Co.—220 50-ton steel-welded box cars; Tennessee Central Ry. Co.—100 50-ton hopper cars; Gulf, Mobile & Ohio R. R. Co.—50 70-ton steel covered hopper cars; and Reading R. R. Co.—1000 50-ton box cars.

Union Pacific R. R. has ordered 1500 50-ton box cars from the Pullman Standard Car Mfg. Co., Chicago.

rators, and auxiliary equipment.

The new coke ovens will be heated with blast furnace gas, and the blast furnace gas heating system also will be extended to a battery of 21 ovens now under construction.

Koppers also will build and erect at the site a 1,000,000 cu ft gas holder for storing blast furnace gas, and will furnish a complete electric precipitator - type blast furnace gas cleaning plant.

Engineering work on the new facilities already has started, Mr. Becker said.

### Steel Shortage Makes Air Freight Shipments Pay for New Company

Cleveland

• • • Flying steel has become a profitable business for a pair of Navy veterans, W. E. Geiselman and Frank Gandola, who formed Airborne Coordinators Inc. about 15 months ago.

Growth of the volume of steel traffic handled via Airborne Coordinators parallels closely the development of the steel shortage, particularly in flat rolled products, that has plagued the automobile industry

and other consumers, large and small, for many months.

Some consumers in order to avoid the costly layoffs and shut-downs which have been frequent companions of the steel shortage, have taken to shipping steel air freight.

Component parts are also being flown from fabricator to assembly plant and Airborne Coordinators have become an aerial link between contractor and subcontractor, manufacturer and supplier, production plants and assembly plants, etc.

Recently, one of the larger clients ordered a plane sent to Indianapolis where it was loaded with component parts and dispatched immediately for the East. In another case, a major producer of heavy trucks sent steel by air to Indianapolis and brought it back in the form of brake drums.

These cases have become so common that Airborne Coordinators are now operating as a forwarder. Not long ago they hauled a 2,000-lb die from the die shop to the user, and a short time later flew a plane load of oil well machinery parts to Texas, which left here at 1:00 o'clock in the morning and reached Texas by 9:00 a.m., where a truck was waiting at the field to haul the parts to the machines.

Air freight rates through Airborne Coordinators are less than most potential users expect, at one-third of prevailing air express rates and two-thirds of regular air line rates. This means \$4.92 per 100 lb Cleveland to New York, airport to airport. Last week they flew a plane load of automobile parts to South America.

Geiselman and Gandola formed Airborne Coordinators when they found that cargo lines had no representation here. They formed a partnership and went to New York to sign up with the lines, and were among the first in the country to do so. Some idea of their progress can be had from the fact that they have been instrumental in forming the Air Freight Forwarders' Association.

That the new businessmen realize that their service will get the acid test when manufacturers are no longer fighting the battle of the shortages is evident in Mr. Geiselman's statement that "many businesses have given up warehousing and now ship by plane . . . they used to figure on three weeks to reach the West Coast, but we've cut the time down to 18 hr."

# MACHINE TOOLS

... News and Market Activities

## Government Control Plan for War Plants Has Industry Buzzing

• • • Many machine tool builders were skidding up show machines this week while others were still working furiously to complete units which will make their debut before the metalworking public at the Dodge-Chicago plant Sept. 17 to 26.

At any other time, the report of Kenneth C. Royall, Secretary of War, for continued government control over 131 war plants costing in excess of \$3,500,000, would have had the machine tool industry buzzing.

Mr. Royall's plan, which still awaits action by Congress, calls for retention in standby condition of 60 complete industrial plants; sale or lease of 71 other plants; and establishment of an industrial equipment reserve consisting of 48,434 machine tools, 6,729 metal shaping devices, and 719,233 other items of production equipment.

Even though current business is quiet in most sectors, between the Machine Tool Show and Mr. Royall's plan, things were looking up for the machine tool industry.

On other fronts, machine tool builders, now in the final phase of show preparations, report mounting interest in new machines on the part of customers, who have been probing various segments of the industry for advance information for the last several weeks, before placing orders after the show.

Most trade sources report that while business is quiet, the show is expected to be a shot in the arm which will take effect immediately, in the form of strong fourth quarter demand.

In the East it has been reported that many orders for machine tools for Italian plants will be filled on short term delivery dates after final agreements for Export-Import Bank Loans have been signed.

Most machine tool builders are in position to offer attractive delivery dates provided actual orders are placed before domestic orders pick up following the Machine Tool Show. Some observers predict a strong demand in the fourth quar-

### Reserve Plan to Call for 131 Plants and 48,434 Tools If Congress Nods

o o o

ter for machine tools from both foreign and domestic sources.

Export-Import Bank credits to three Italian companies for expansion of plant facilities include grants of \$23 million out of a total of \$100 million slated for restoration and expansion of Italy's industrial dominion, and as additional credits are granted to smaller companies, informed sources anticipate larger orders for machine tools.

According to some sources, Italian machine tool purchases will be made soon, but orders cannot be placed until the actual agreements have been signed between the Export-Import Bank and the borrowing companies. First agreements are expected to be signed within a month with Fiat, Montecatini, and others.

When the machine tool orders are placed, they will be handled either through the manufacturers' branches in Europe, through export agencies in New York, or through American banking firms engaged in financing Italian plants. Orders will probably not be placed through regular eastern machine tool distributors who sell to domestic buyers in this country, according to trade sources.

Indications are that business will remain quiet in August in the East, although some manufacturers feel things will be better by the end of the month. Generally, manufacturers have approximately 2½ pct fewer on payrolls than a year ago. At the same time, wages average around 7 pct above a year ago.

Earnings reports available indicate about half of the tool manufacturers in New England did not earn as much in this year's second quarter as in the like 1946 period, while half did a little better. Most of them feel third quarter earn-

ings will be considerably under last year.

In Detroit, some machine tool experts are about convinced that the old standby single purpose machine tools will never again show their former heavy volume of business, and many sources report that practically all new quotations are on four multiple operating machines of the transfer type. Whereas the tool salesman used to be handed a print and asked to supply a machine which would simply drill a few holes for face and bore, the customers now hold out the finished print of the part, show the salesman the rough casting or forging and say, "we want a machine that will do the entire job."

This stand has placed emphasis on the need of expert tool engineers in the sales division. Operators of such machinery are not required to have any special skill, but shops ordering the new machines have found they need expert electrical, hydraulic and maintenance men to keep the complex transfer type machinery in good operating condition.

With the September show in Chicago will come even more emphasis on the new machinery and representatives of many plants planning long-term improvement of facilities are expected to come primed with questions about these new developments.

Some observers believe that the higher prices on machine tools will not be much of a hurdle in the special machinery types. They point out that the labor saving features on the automatic transfer machine have been one of the biggest attractions.

In Cincinnati, the machine tool market is quiet except for preparation for the Machine Tool Show. Bookings are better than some sources expected, but far from enough to require capacity operations. Backlogs are being whittled down rapidly and most plants have fairly broad operations on contract and job work. New business continues to stem primarily from domestic sources, with demand about evenly divided among types.

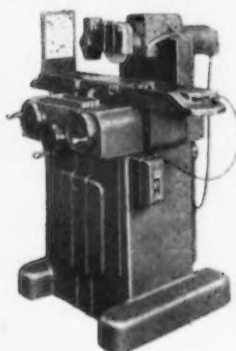


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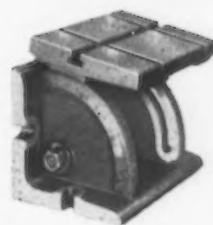
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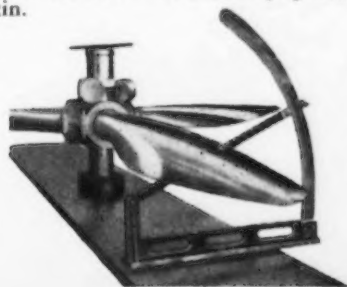


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THE IRON AGE, August 14, 1947—153

# NONFERROUS METALS

... News and Market Activities

## Copper

• • • Demand for copper is still well in excess of supply but the serious threat to future domestic production represented by the possibility of strikes at the plants of principal producers is well on the way to a satisfactory adjustment on the basis of the Kennecott agreement with the union. There is as yet no definite assurance that there will not be any strike but progress in the negotiations gives every evidence of uninterrupted production. Wire mills are not yet able to obtain all the copper they need for maximum production but the brass mills no longer require all the copper which could be made available to them. The price of nearby copper futures is tending to approach the current copper market price as it becomes apparent to traders that a surplus copper market is farther off than originally estimated. However, the futures market is thin and represents only a relatively small tonnage. The President's veto of the subsidy bill is not expected to have any serious effect in reducing copper production. The end of the Braden Copper strike in Chile is not yet in sight.

## Tin

• • • The Bolivian ambassador is reported to have stated that, in negotiating a new sales contract with the U. S., Bolivia would expect more for its tin concentrates than the present price of 76¢ per lb of metal contained. Subsequently, the report was repudiated by the Bolivian Embassy who stated that the Ambassador had made no statement to newspapermen after conferring with the assistant secretary of state. Mem-

bers of the industry are of the opinion that there must be some basis for the report even though it has been denied and that it was only to be expected that Bolivia would seek a price increase at the expiration of its contract. The trade is of the opinion that there will be no move to increase the price of tin from any other quarter and that the current price is very likely to be held throughout 1947.

## Lead

• • • Supply of lead is now in approximate balance with demand. All consumers are able to obtain their full requirements although there is no surplus left afterward. The scrap recovery tonnage has risen from the former rate of 30,000 tons per month to 40,000 tons. The trade does not anticipate that this high rate of scrap recovery may be expected to continue very long. However there are no additional mines being opened up and no expectations of any significant expansion in the production of currently operated mines. New York scrap dealers report a price increase of 1/2¢ per lb in the price of soft lead scrap, bringing it to a range of 10 1/2¢ to 11¢. The President's veto of the metals subsidy bill is not expected to have any influence on lead production as the current price is above the subsidy price offered by the bill.

## Zinc

• • • All grades of zinc are in ample supply and the market is reported to be quiet. The President's veto of the 2 year \$70 million subsidy bill for copper, lead, zinc and manganese was a severe blow to the marginal producers of

zinc who had been under the impression that enactment of the bill was a foregone conclusion and in many instances had reopened their workings. Now many producers, particularly those in the Tri-State District, must of necessity close down again. The bill was to continue the subsidies of the Premium Price Plan which were in effect up to June 30, and called for the addition of manganese to the program. The measure called for payment of the difference between market prices and 28¢ for copper, 18¢ for zinc and 18¢ for lead.

## Aluminum Ingot Prices Up

New York

• • • Aluminum ingot producers have advanced prices of remelted aluminum by 1/2¢ to 3/4¢ per lb as the result of increased buying by nonferrous foundries and reportedly higher scrap prices. Scrap dealers here do not confirm higher scrap aluminum prices during the last few weeks. Ingot producers report that apparently the inventory reduction cycle of the foundries has been completed and now that the industry has found itself with orders on hand and no metal to melt, it has begun to re-order on an orderly basis.

## Offer New Aluminum Sheet

New York

• • • A new aluminum utility sheet designed to compete with steel sheet for many uses is offered by Kaiser Aluminum Div., Permanente Products Co. Inc., at a price said to be approximately 15 pct below sheet aluminum previously offered to sheet metal fabricators.

Henry J. Kaiser, who announced the new general purpose aluminum sheet and said that it was immediately available, stated that it could be fabricated with the regular equipment on hand in any sheet metal shop.

The Kaiser utility sheet will sell f.o.b. mill, Spokane, Wash., at 21¢ to 22.5¢ per lb in standard widths and gages.

## Nonferrous Metals Prices

Cents per pound

	Aug. 6	Aug. 7	Aug. 8	Aug. 9	Aug. 11	Aug. 12
Copper, electro, Conn. ....	21.50	21.50	21.50	21.50	21.50	21.50
Copper, Lake, Conn. ....	21.625	21.625	21.625	21.625	21.625	21.625
Tin, Straits, New York ....	80.00	80.00	80.00	80.00	80.00	80.00
Zinc, East St. Louis ....	10.50	10.50	10.50	10.50	10.50	10.50
Lead, St. Louis ....	14.80	14.80	14.80	14.80	14.80	14.80



### Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, f.o.b. shipping point (min. 10,000 lb) .....	15.00
Aluminum pig, f.o.b. shipping point .....	14.00
Antimony, American Laredo Tex. ....	\$3.00
Beryllium copper, 3.75-4.25% Be; dollars per lb contained Be. ....	\$17.00
Beryllium aluminum, 5% Be; dollars per lb contained Be .....	\$35.50
Cadmium, del'd .....	\$1.75
Cobalt, 97-99% (per lb) .....	\$1.65 to \$1.72
Copper, electro, Conn. Valley .....	21.50
Copper, lake, Conn. Valley .....	21.625
Gold, U. S. Treas., dollars per oz. ....	\$35.00
Indium, 99.8%, dollars per troy oz. ....	\$2.25
Iridium, dollars per troy oz. ....	\$80 to \$90
Lead, St. Louis .....	14.80
Lead, New York .....	15.00
Magnesium, 99.8+% .....	20.50
Magnesium, sticks, carlots .....	36.00
Mercury, dollars per 76-lb flask, f.o.b. New York. ....	\$55.00 to \$57.00
Nickel, electro, f.o.b. New York ..	37.67
Palladium, dollars per troy oz. ....	\$24.00
Platinum, dollars per troy oz. ....	\$53 to \$56
Silver, New York, cents per oz. ....	61.75
Tin, Straits, New York .....	80.00
Zinc, East St. Louis .....	10.50
Zinc, New York .....	11.005
Zirconium copper, 6 pct Zr, per lb contained Zr .....	\$8.75

### Remelted Metals

#### Brass Ingot

(Cents per lb, in carloads)

85-5-5 ingot	
No. 115 .....	19.00
No. 120 .....	18.50
No. 123 .....	18.00
80-10-10 ingot	
No. 305 .....	23.00
No. 315 .....	21.00
85-10-2 ingot	
No. 210 .....	28.75
No. 215 .....	27.25
No. 245 .....	21.25
Yellow ingot	
No. 405 .....	15.25
Manganese Bronze	
No. 421 .....	17.25

#### Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys:	
0.30 copper, max. ....	15.75
0.60 copper, max. ....	15.50
Piston alloys (No. 122 type) ..	14.25
No. 12 aluminum. (No. 2 grade) ..	13.75
108 alloy .....	14.00
195 alloy .....	14.75
AXS-679 .....	14.00
Steel deoxidizing aluminum, notch-bar, granulated or shot .....	14.50
Grade 1—95 pct-97½ pct .....	13.00
Grade 2—92 pct-95 pct. ....	12.50
Grade 3—90 pct-92 pct. ....	12.50
Grade 4—85 pct-90 pct .....	11.75

### Electroplating Supplies

#### Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer. ....	37½
Electrodeposited .....	32.84
Rolled, oval, straight, delivered. .	32.59
Brass, 80-20, frt allowed	
Cast, oval, 15 in. or longer ....	33½
Zinc, Cast, 99.99 .....	18½
Nickel, 99 pct plus, frt allowed	
Cast .....	51
Rolled, depolarized .....	52
Silver 999 fine .....	
Rolled, 1000 oz. lots, per troy oz. .	67½

#### Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum. ....	43.00
Copper sulphate, 99.5, crystals, bbls .....	11.50
Nickel salts, single, 425 lb bbls, frt allowed .....	14.50
Silver cyanide, 100 oz. lots, per oz. .	54.00
Sodium cyanide, 96 pct, domestic, 200 lb drums .....	15.00
Zinc cyanide, 100 lb drums. ....	34.00
Zinc sulphate, 89 pct, crystals, bbls, frt allowed .....	7.75

### Mill Products

#### Aluminum

(Cents per lb, base, f.o.b. shipping point, subject to extras for quantity, gage, size, temper and finish)

Drawn tubing: 2 to 3 in. OD by 0.065 in. wall: 3S, 43.5¢; 52S-O, 67¢; 24S-T, 71¢; base, 30,000 lb.	
Plate: ¼ in. and heavier: 2S, 3S, 21.2¢; 52S, 24.2¢ 61S, 23.8¢; 24S, 24S-AL, 24.2¢; 75S, 75S-AL, 30.5¢; base, 30,000 lb.	
Flat Sheet: 0.136-in. thickness: 2S, 3S, 23.7¢; 52S, 27.2¢; 61S, 24.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢; base, 30,000 lb.	
Extruded Solid Shapes: factor determined by dividing the perimeter of the shape by its weight per foot. For factor 1 through 4, 3S, 26¢; 14S, 32.5¢; 24S, 35¢; 53S, 61S, 28¢; 63S, 27¢; 75S, 45.5¢; base, 30,000 lb.	
Wire, Rod and Bar: screw machine stock, rounds, 17S-T, ¼ in., 29.5¢; ½ in., 37.5¢; 1 in., 26¢; 2 in., 24.5¢; hexagons, ¼ in., 35.5¢; ½ in., 30¢; 1 in., 2 in., 27¢; base, 5000 lb. Rod: 2S, 3S, 1¼ to 2¼ in. diam, rolled, 23¢; cold-finished, 23.5¢ base, 30,000 lb. Round Wire: drawn, cold, B & S gage 17-18; 2S, 3S, 33.5¢; 56S, 39.5¢; 10,000 lb base. B & S gage 00-1: 2S, 3S, 21¢; 56S, 30.5¢. B & S 15-16; 2S, 3S, 32.5¢; 56S, 38¢; base, 30,000 lb.	

#### Magnesium

(Cents per lb, f.o.b. mill. Base quantity 30,000 lb.)

Sheet and Plate: M. F.S. ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 19, 59¢-61¢; 14, 69¢-74¢; 16, 79¢-81¢; 18, 87¢-89¢; 22, 1.25-1.31; 24, 1.71-1.75.	
Round Rod: M. diam, in., ¼ to ¾, 47¢; ½ to ¾, 45¢; 1¼ to 2¼, 43.5¢; 3½ to 5, 42.5¢. Other alloys higher.	
Square, Hexagonal Bar: M. size across flats, in., ¼ to ¾, 52.5¢; ½ to ¾, 47.5¢; 1¼ to 2¼, 45¢; 3½ to 5, 44¢. Other alloys higher.	
Solid Shapes, Rectangles: M. form factors, 1 to 4, 46¢; 11 to 13, 49¢; 20 to 22, 51.5¢; 29 to 31, 59.5¢ 38 to 40, 75.5¢ 47 to 49, 98¢. Other alloys higher.	
Round Tubing: M. wall thickness, outside diam, in., 0.049 to 0.057, ¼ to 5/16, \$1.21; 5/16 to ¾, \$1.12; ¾ to 7/16, 97¢; 0.058 to 0.064, 7/16 to ¾, 89¢; ¾ to 1, 81¢; 0.065 to 0.082, ¾ to 1, 76¢; ¾ to 1, 72¢ 0.083 to 0.108, 1 to 2, 68¢; 0.165 to 0.219, 2 to 3, 59¢; 3 to 4, 57¢. Other alloys higher.	

#### Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled .....	54	43
No. 35 sheets .....	41	
Strip, cold-rolled .....	60	44
Rod		
Hot-rolled .....	50	39
Cold-drawn .....	55	44
Angles, hot-rolled .....	50	39
Plates .....	52	41
Seamless tubes .....	33	71
Shot and blocks .....		31

#### Zinc

(Cents per lb, f.o.b. mill)

Sheet, l.c.l. ....	15.50
Ribbon, ton lots .....	14.50
Plates	
Small .....	13.50
Large, over 12 in. ....	14.50

#### Copper, Brass, Bronze

(Cents per pound, f.o.b. mill)

	Extruded Shapes	Rods	Sheets
Copper .....	33.53		33.68
Copper, hot-rolled .....	30.03		
Copper, drawn .....	31.03		
Low brass .....	34.04*	31.07	31.38
Yellow brass .....	32.39*	29.32	29.63
Red brass .....	34.65*	31.63	31.99
Naval brass .....	29.56	28.31	34.25
Leaded brass ..	27.98	24.39	29.63
Commercial bronze .....	35.52*	32.80	33.11
Manganese bronze ..	33.14	31.64	37.75
Phosphor bronze, 5 pct. ....	53.25*	52.25	52.00
Muntz metal .....	29.17	27.92	32.36
Everdur, Hercaloy, Olympic, etc. ....	37.07	35.57	38.44
Nickel silver, 5 pct. ....	41.20	40.28	38.67
Architectural bronze .....	27.94		
*Seamless tubing.			

### Scrap Metals

(Dealers' buying prices, f.o.b. New York in cents per pound.)

#### Brass Mill Scrap

(Lots of less than 15,000 lb.)

Cartridge brass turnings .....	14½
Loose yellow brass trimmings .....	18½

#### Copper and Brass

No. 1 heavy copper and wire .....	15½-16½
No. 2 heavy copper and wire .....	14½-15½
Light copper .....	13½-14½
Auto radiators (unsweated) .....	8½-9
No. 1 composition .....	10½-11
No. 1 composition turnings .....	10-10½
Clean red car boxes .....	9-9½
Cocks and faucets .....	8½-9
Mixed heavy yellow brass .....	7-7½
Old rolled brass .....	7-7½
Brass pipe .....	8-8½
New soft brass clippings .....	11-11½
Brass rod ends .....	9½-10
No. 1 brass rod turnings .....	8½-9

#### Aluminum

Alum. pistons free of struts ..	3½-4
Aluminum crankcases .....	5-5½
2S aluminum clippings .....	8-8½
Old sheet & utensils .....	5½-6
Mixed borings and turnings ..	2
Misc. cast aluminum .....	5-5½
Dural clips (24S) .....	5-5½

#### Zinc

New zinc clippings .....	6-6½
Old zinc .....	4½-4¾
Zinc routings .....	1½-2
Old die cast scrap .....	2½-3

#### Nickel and Monel

Pure nickel clippings .....	15½-17½
Clean nickel turnings .....	14-15
Nickel anodes .....	16-17
Nickel rod ends .....	17-18
New Monel clippings .....	10-10½
Clean Monel turnings .....	7-8
Old sheet Monel .....	9½-10
Old Monel castings .....	7½-8
Inconel clippings .....	8-8½
Nickel silver clippings, mixed ..	7½-8
Nickel silver turnings, mixed ..	5½-6

#### Lead

Soft scrap lead .....	10½-11
Battery plates (dry) .....	5-5½

#### Magnesium Alloys

Segregated solids .....	6½-7
Castings .....	4½-5½

#### Miscellaneous

Block tin .....	63-65
No. 1 pewter .....	48-50
No. 1 auto babblitt .....	38-40
Mixed common babblitt .....	11½-12
Solder joints .....	12-13
Siphon tops .....	38-39
Small foundry type .....	13-13½
Monotype .....	12-12½
Lino and stereotype .....	11½-12
Electrotype .....	9½-10
New type shell cuttings .....	11-11½
Clean hand picked type shells ..	4½-5
Lino and stereo dross .....	5-5½
Electro dross .....	3-3½

#### Lead Products

(Cents per lb)

F.o.b. shipping point freight collect. Freight equalized with nearest free delivery point.	
Full lead sheets .....	18.25
Cut lead sheets .....	18.75
Lead pipe, manufacturing point. ....	17.50
Lead traps and bends .....	List +42%
Combination lead and iron bends and ferrules, also combination lead and iron ferrules .....	List +42%
Lead wool .....	19.60

## Steel Mill Grades Dip in Major Markets

### New York

• • • The price of heavy melting steel scrap has dropped for the first time in 3 months. The upward trend that began late in May was halted this week as prices turned weaker in several major markets. Declines averaging \$1.50 in Chicago, \$1.25 in Pittsburgh and \$1 in Philadelphia sent THE IRON AGE steel scrap composite down \$1.25 for the week.

Thus the dip is by no means as sharp as that which occurred this spring when this average of heavy melting steel in Pittsburgh, Chicago, and Philadelphia went off a trifle more than \$4 in the first 2 weeks in April. At New York the top broker buying price was off \$3.50, Cincinnati was down \$2 and Detroit \$1. Boston was also weaker.

Few mills were in the market though a 10,000-ton sale was made last week in Pittsburgh at \$42, off \$1 from the previous quotation. In view of the strong demand, scrap sources were not expecting a very sharp price break at this time although some of the higher quotations of the past few weeks may be leveled off. Cast grades had not yet begun to show the general weakness though some market observers felt they might ease a bit soon.

**PITTSBURGH** — With a substantial tonnage of heavy melting scrap purchased this week in Pittsburgh at \$42 a ton, the price here slipped off \$1 a ton on heavy grades. Baltimore & Ohio and the New York Central railroad scrap offerings went for prices around \$47 a ton for heavy melting and \$49.50 for specialties, but none of it came into this area. Consequently, based on broker sales to consumers of scrap from the last Pennsylvania railroad list, the price of R.R. heavy melting is off 25¢ a ton. The New York Central scrap went mainly to Buffalo and the B. & O. scrap went to Ohio and other points. Specialties are hard to obtain so the prices on these items held firm, neither reflecting the softness of the openhearth grades nor the strength of the railroad grades sold out of district. Mills are staying out of the market at this time, trying to get their cue on what they think might be a turn in the trends. One mill refused to buy at \$42 a ton and another had more offered to it at \$42 a ton than it would take. The drop in the eastern market is not reflected here

mainly because eastern prices were out of line with delivered prices of local scrap.

**CHICAGO** — Last week saw a sharp break in scrap prices with the indication that the bottom may settle off much lower than the last quotation. Brokers were hesitant about selling too much tonnage at the first new price and mills also placed rather small orders. Very few observers believe that the downward trend can last too long as scrap is still tight and if the mills insist on trying to depress prices too far a reaction similar to that experienced from May through July is bound to take place. Surprisingly the last railroad sale of R.R. heavy melting steel brought a very high price.

**PHILADELPHIA** — All mills were out of the market in this district last week and brokers are said not to be buying. Mill orders during the last few weeks are reported to have been for small tonnages, but this material rolling in at current high prices has served to build up fairly good inventories. Dealers are reported to be not anxious to make sales at prices lower than the recent market. In the absence of actual transactions in this area to establish the market, heavy melting grades and turnings prices are shown at \$1 lower than last week.

**NEW YORK** — Brokers' buying prices for heavy melting steel dropped off from last week's \$36 to \$36.50 quotation to \$33 early this week. They had been as high as \$37 during the middle of last week. Shipments were fair and it appeared that no supply sources were withholding material at this time. It was primarily a brokers' market; very few mills were buying. Cast grades were unchanged for the week.

**DETROIT** — Last week saw a definite effort to break the high scrap prices. All users suddenly went out of the market and left the brokers puzzled as to which way to move. Buying was almost at a standstill, and dealers, afraid that a downward trend was inevitable, were shipping heavily on the old unfilled orders. Early in the week most dealers were willing to accept orders, which from past experience indicates prices in this area will surely go down. On Monday the best representative new broker buying price that could be ascertained was \$1 cheaper than that of the previous week.

**CLEVELAND** — Considerable pressure is being exerted to amplify the beginning of a break. Brokers' buying prices are still high enough in some cases to lead some sources to believe there is not enough scrap to substantiate continued lower prices. Some of the mills will be back in by the end of the month or sooner and reliable sources in the trade expect the

price of No. 1 heavy melting in the Valley to settle somewhere around \$11.00 perhaps by the end of the week.

**ST. LOUIS** — The largest consumers of steel mill and foundry grades here are out of the market, and indicate that they will come in again within a week at the same or lower prices, certainly not higher, so that prices are nominally unchanged. The 100° and over temperatures in the area have slowed down the movement of scrap.

**BUFFALO** — Trade excitement over the advance to \$43 for openhearth scrap subsided this week and brokers and dealers settled back to see what would happen next. Withdrawal of leading consumers following the upturn took some of the starch out of the market and prices turned a bit sloppy. Brokers representing Pittsburgh district mills stepped out of the picture east of Rochester and offerings from that section were reported to local dealers at \$1 to \$2 below the peak. Shipments increased with prices and any tendency to hold back disappeared completely. Water receipts were 8500 tons, 5000 coming from Duluth by lake and the remainder from New York via the barge canal.

**CINCINNATI** — The market here has taken a sharp slump and it is reported that all grades of scrap iron and steel have fallen approximately \$2. It is reported in this area that mills are not buying in an effort to bring the prices that surged upward in the past 2 or 3 weeks back to the level they held before that. While the need for scrap is still very urgent, mills are showing no interest in buying and inventories are being eaten into.

**BIRMINGHAM** — After a general advance in scrap prices here last week that saw openhearth grades take a \$3 per ton jump, the largest consumer of steel scrap in this district is out of the market and very little material of any grade is being bought. Strong buyer resistance has developed and quoted prices are on the basis of last sales.

**BOSTON** — Major prices are \$3 to \$4 lower with indications of not having hit bottom yet. They have not hit a level that attracts steel mill buying, and brokers are endeavoring to establish that level. In the meantime Connecticut melters are taking all the cast they can get at \$44 to \$45 a ton f.o.b.

**TORONTO** — Canadian ceiling prices on iron scrap materials have been discontinued by Wartime Prices and Trade Board, but ceiling prices and controls remain on steel scrap. While no definite prices have been established on iron scrap since controls were abandoned, some dealers are offering \$30 per gross ton for No. 1 cast and say that no price has been set for stove plate, carwheels or malleable as there have been none of these lines on the market for a considerable time.



# IRON AND STEEL SCRAP PRICES

## PITTSBURGH

Per gross ton delivered to consumer:

No. 1 heavy melting	\$41.00 to \$42.00
RR. hvy. melting	43.25 to 43.75
No. 2 hvy. melting	41.00 to 42.00
RR. scrap rails	46.00 to 47.00
Rails 2 ft. and under	50.00 to 51.00
No. 1 comp'd bundles	41.00 to 42.00
Hand bldd. new shts.	41.00 to 42.00
Hvy. axle turn.	40.00 to 41.00
Hvy. steel forge turn.	40.00 to 41.00
Mach. shop turn.	34.00 to 35.00
Shoveling turn.	36.00 to 37.00
Mixed bor. and turn.	34.00 to 35.00
Cast iron borings	35.00 to 36.00
No. 1 cupola cast	41.00 to 42.00
Hvy. breakable cast	37.00 to 37.50
Malleable	52.00 to 53.00
RR. knuck and coup.	48.00 to 49.00
RR. coil springs	48.00 to 49.00
RR. leaf springs	48.00 to 49.00
Rolled steel wheels	48.00 to 49.00
Low phos.	47.50 to 48.00

## CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$40.00 to \$40.50
No. 2 hvy. melting	40.00 to 40.50
No. 1 bundles	40.00 to 40.50
No. 2 dealers' bundles	40.00 to 40.50
Bundled mach. shop turn.	40.00 to 40.50
Galv. bundles	38.00 to 38.50
Mach. shop turn.	35.00 to 35.50
Short shov. turn.	37.00 to 37.50
Cast iron borings	36.00 to 36.50
Mix. borings & turn.	35.00 to 35.50
Low phos. hvy. forge.	45.00 to 46.50
Low phos. plates	42.00 to 43.00
No. 1 RR. hvy. melt.	44.50 to 45.50
Rerolling rails	51.00 to 51.50
Miscellaneous rails	47.50 to 48.00
Angles & splice bars	48.50 to 49.00
Locomotive tires, cut	45.00 to 46.00
Cut bolster & side frames	47.50 to 48.00
Standard stl. car axles	51.00 to 51.50
No. 3 steel wheels	46.50 to 47.00
Couplers & Knuckles	47.00 to 48.00
Malleable	61.00 to 63.00
No. 1 mach. cast.	51.00 to 51.50
Rails 2 ft. and under	52.00 to 52.50
No. 1 agricul. cast.	46.00 to 47.00
Hvy. breakable cast.	40.00 to 44.00
RR. grate bars	44.00 to 44.50
Cast iron brake shoes	46.50 to 47.00
Cast iron carwheels	44.50 to 45.50

## CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$35.00 to \$36.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 bundles	35.00 to 36.00
No. 2 bundles	35.00 to 36.00
Mach. shop turn.	30.50 to 31.00
Shoveling turn.	32.50 to 33.00
Cast iron borings	30.50 to 31.00
Mixed bor. & turn.	30.00 to 31.00
Low phos. plate	41.00 to 42.00
No. 1 cupola cast.	46.00 to 47.00
Hvy. breakable cast.	37.00 to 38.00
Scrap rails	41.00 to 42.00

## BOSTON

Dealers' buying prices per gross ton, f.o.b. cars:

No. 1 hvy. melting	\$36.00 to \$37.00
No. 2 hvy. melting	33.00
Nos. 1 and 2 bundles	33.00
Busheling	33.00
Shoveling turn.	27.00 to 27.50
Machine shop turn.	25.00 to 25.50
Mixed bor. & turn.	25.00 to 25.50
C/P cast. chem. bor.	25.00 to 26.00
No. 1 machinery cast.	44.00 to 45.00
No. 2 machinery cast.	44.00 to 45.00
Heavy breakable cast.	44.00 to 45.00
Stove plate	44.00 to 45.00

## DETROIT

Per gross ton, brokers' buying prices, f.o.b. cars:

No. 1 hvy. melting	\$36.00 to \$37.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 bundles	36.00 to 37.00
New busheling	36.00 to 37.00
Flashings	36.00 to 37.00
Mach. shop turn.	28.50 to 29.50
Shoveling turn.	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Mixed bor. & turn.	29.00 to 30.00
Low phos. plate	39.00 to 40.00
No. 1 cupola cast.	39.50 to 40.50
Hvy. breakable cast.	31.00 to 32.00
Stove plate	32.00 to 34.00
Automotive cast.	38.00 to 40.00

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

## PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$39.00 to \$40.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	39.00 to 40.00
No. 2 bundles	39.00 to 40.00
Mach. shop turn.	30.00 to 31.00
Shoveling turn.	30.00 to 31.00
Mixed bor. & turn.	30.00 to 31.00
Clean cast chemical bor.	34.00 to 35.00
No. 1 cupola cast	48.00 to 49.00
Hvy. breakable cast.	45.00 to 46.00
Cast. charging box.	45.00 to 46.00
Clean auto cast.	48.00 to 49.00
Hvy. axle forge turn.	39.00 to 40.00
Low phos. plate	44.00 to 45.00
Low phos. punchings	44.00 to 45.00
Low phos. bundles	43.00 to 44.00
RR. steel wheels	45.00 to 46.00
RR. coil springs	45.00 to 46.00
RR. malleable	58.00 to 60.00

## ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$39.00 to \$40.00
No. 2 hvy. melting	38.00 to 39.00
Bundled sheets	38.00 to 39.00
Mach. shop turn.	31.25 to 32.25
Locomotive tires, uncut.	41.00 to 42.00
Mis. std. sec. rails	42.00 to 43.00
Rerolling rails	48.00 to 49.00
Steel angle bars	40.00 to 41.00
Rails 3 ft. and under	43.00 to 44.00
RR. steel springs	40.50 to 41.50
Steel car axles	41.50 to 42.50
Grate bars	36.00 to 37.00
Brake shoes	34.00 to 35.00
Malleable	54.00 to 56.00
Cast iron car wheels	42.00 to 43.00
No. 1 machinery cast.	43.00 to 44.00
Hvy. breakable cast	35.00 to 36.00

## BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$38.50 to \$39.00
No. 2 hvy. melting	38.50 to 39.00
No. 2 bundles	38.50 to 39.00
No. 1 busheling	38.50 to 39.00
Long turnings	25.50 to 26.00
Shoveling turnings	27.50 to 28.00
Cast iron borings	26.50 to 27.00
Bar crops and plate	41.00 to 41.50
Structural and plate	41.00 to 41.50
No. 1 cupola cast.	44.00 to 45.00
Stove plate	42.00 to 42.50
No. 1 RR. hvy. melt.	39.50 to 40.00
Steel axles	41.50 to 42.00
Scrap rails	39.50 to 40.00
Rerolling rails	40.50 to 41.00
Angles & splice bars	40.50 to 41.00
Rails 3 ft. & under	40.50 to 41.00
Cast iron carwheels	35.00 to 36.00

## YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$41.50 to \$42.00
No. 2 hvy. melting	41.50 to 42.00
Mach. shop turn.	32.00 to 34.00
Short shov. turn.	34.00 to 35.00
Cast iron borings	34.00 to 35.00
Low phos.	43.00 to 44.00

## BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$42.00 to \$43.00
No. 2 hvy. melting	42.00 to 43.00
No. 1 bundles	42.00 to 43.00
No. 2 bundles	42.00 to 43.00
No. 1 busheling	42.00 to 43.00
Mach. shop turn.	32.00 to 33.00
Shoveling turn.	34.00 to 35.00
Cast iron borings	32.00 to 33.00
Mixed bor. & turn.	32.00 to 33.00
No. 1 cupola cast.	40.00 to 42.00
Charging box cast.	36.00 to 38.00
Stove plate	39.00 to 40.00
Clean auto cast.	40.00 to 42.00
Small indl. malleable	39.00 to 41.00
RR. malleable	46.00 to 52.00
Low phos. plate	45.00 to 46.00
Scrap rails	40.00 to 45.00
Rails 3 ft. & under	44.00 to 48.00
RR. steel wheels	44.00 to 48.00
Cast iron carwheels	44.00 to 48.00
RR. coil & leaf spgs.	44.00 to 48.00
RR. knuckles & coup.	44.00 to 48.00

## CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$40.50 to \$41.00
No. 2 hvy. melting	40.50 to 41.00
No. 1 bundles	40.50 to 41.00
No. 2 bundles	40.50 to 41.00
Drop forge flashings	40.50 to 41.00
Mach. shop turn.	32.00 to 33.00
Shoveling turn.	33.00 to 34.00
No. 1 busheling	42.00 to 43.00
Steel axle turn.	40.50 to 41.00
Cast iron borings	33.00 to 34.00
Mixed bor. & turn.	32.00 to 32.50
Low phos.	41.00 to 42.00
No. 1 machinery cast.	47.00 to 47.50
Malleable	54.00 to 55.00
RR. Cast	47.00 to 47.50
Railroad grate bars	42.00 to 44.00
Stove plate	42.00 to 44.00
RR. hvy. melting	42.00 to 43.00
Rails 3 ft. & under	47.00 to 48.00
Rails 18 in. & under	48.00 to 49.00

## SAN FRANCISCO

Per gross ton f.o.b. shipping point

No. 1 hvy. melting	\$22.00
No. 2 hvy. melting	22.00
No. 2 bales	22.00

Per gross ton delivered to consumer

No. 3 bales	\$16.50
Mach. shop turn.	16.00
Elec. furn. 1 ft. und.	23.00
No. 1 cupola cast.	\$32.00 to 33.00
RR. hvy. melting	23.00

## LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$22.50
No. 2 hvy. melting	22.50
No. 1 bales	22.50
No. 2 bales	22.50
No. 3 bales	16.00
Mach. shop turn.	14.50
No. 1 cupola cast.	\$32.00 to 33.00
RR. hvy. melting	23.00

## SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. hvy. melt.	\$20.00 to \$22.00
Elec. furn. 1 ft. und.	\$25.50 to 27.00
No. 1 cupola cast.	29.00
RR. hvy. melting	23.00

## HAMILTON, ONT.

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point

Heavy melting	\$17.50*
No. 1 bundles	17.50*
No. 2 bundles	17.00*
Mixed steel scrap	15.50*
Rails, remelting	18.50*
Rails, rerolling	21.50*
Bushelings	13.00*
Mixed borings & turnings	12.50*
Electric furnace bundles	20.50*
Manganese steel scrap	20.00*
No. 1 cast	19.00*
Stove plate	17.50*
Car wheels, cast	19.50*
Malleable iron	16.00*

\* Ceiling price.

# Comparison of Prices . .

Advances over past week in Heavy Type, declines in *lites*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Fat-Rolled Steel:	Aug. 12, 1947	Aug. 5, 1947	July 15, 1947	Aug. 13, 1946
(cents per pound)				
Hot-rolled sheets . . . . .	2.80	2.80	2.50	2.425
Cold-rolled sheets . . . . .	3.55	3.55	3.20	3.275
Galvanized sheets (10 ga.) . . . . .	3.95	3.95	3.55	4.05*
Hot-rolled strip . . . . .	2.80	2.80	2.50	2.45
Cold-rolled strip . . . . .	3.55	3.55	3.20	3.05
Plates . . . . .	2.95	2.95	2.65	2.50
Plates, wrought iron . . . . .	6.85	6.85	5.95	4.112
Stain's c-r strip (No. 302) . . . . .	30.30	30.30	30.30	30.30

Tin and Terneplate:	Aug. 12, 1947	Aug. 5, 1947	July 15, 1947	Aug. 13, 1946
(dollars per base box)				
Tinplate, standard cokes . . . . .	\$5.75	\$5.75	\$5.75	\$5.00
Tinplate, electro (0.50 lb) . . . . .	5.05	5.05	5.05	4.50
Special coated mfg. ternes . . . . .	4.90	4.90	4.90	4.30

Bars and Shapes:	Aug. 12, 1947	Aug. 5, 1947	July 15, 1947	Aug. 13, 1946
(cents per pound)				
Merchant bars . . . . .	2.90	2.90	2.60	2.50
Cold-finished bars . . . . .	3.55	3.55	3.20	3.10
Alloy bars . . . . .	3.30	3.30	3.05	2.92
Structural shapes . . . . .	2.80	2.80	2.50	2.35
Stainless bars (No. 302) . . . . .	26.00	26.00	26.00	25.97
Wrought iron bars . . . . .	7.15	7.15	6.15	4.76

Wire and Wire Products:	Aug. 12, 1947	Aug. 5, 1947	July 15, 1947	Aug. 13, 1946
(cents per pound)				
Bright wire . . . . .	3.55	3.55	3.30	3.05
Wire nails . . . . .	4.25	4.25	3.75	3.75

Rails:	Aug. 12, 1947	Aug. 5, 1947	July 15, 1947	Aug. 13, 1946
(dollars per 100 lb)				
Heavy rails . . . . .	\$2.50	\$2.50	\$2.50	\$43.39*
Light rails . . . . .	2.85	2.85	2.85	49.18*

Semifinished Steel:	Aug. 12, 1947	Aug. 5, 1947	July 15, 1947	Aug. 13, 1946
(dollars per gross ton)				
Rerolling billets . . . . .	\$45.00	\$45.00	\$42.00	\$39.00
Sheet bars . . . . .	59.00	59.00	50.00	38.00
Slabs, rerolling . . . . .	45.00	45.00	42.00	39.00
Forging Billets . . . . .	55.00	55.00	50.00	47.00
Alloy blooms, billets, slabs . . . . .	66.00	66.00	61.00	58.43

Wire Rods and Skelp:	Aug. 12, 1947	Aug. 5, 1947	July 15, 1947	Aug. 13, 1946
(cents per pound)				
Wire rods . . . . .	2.80*	2.80	2.55	2.30
Skelp . . . . .	2.60	2.60	2.35	2.05

Pig Iron:	Aug. 12, 1947	Aug. 5, 1947	July 15, 1947	Aug. 13, 1946
(per gross ton)				
No. 2, foundry, Phila. . . . .	\$41.22	\$40.39	\$38.22	\$30.43
No. 2, Valley furnace . . . . .	36.50	36.50	33.50	28.50
No. 2, Southern Cin'ti . . . . .	38.25	38.25	34.75	27.80
No. 2, Birmingham . . . . .	33.38	33.38	29.88	24.88
No. 2, foundry, Chicago† . . . . .	36.00	36.00	33.00	28.50
Basic del'd Philadelphia . . . . .	40.72	39.89	38.89	29.93
Basic, Valley furnace . . . . .	36.00	36.00	33.00	28.00
Malleable, Chicago† . . . . .	36.50	36.50	33.50	28.50
Malleable, Valley . . . . .	36.50	36.50	33.50	28.50
Charcoal, Chicago . . . . .	49.49	49.49	45.99	42.34
Ferromanganese‡ . . . . .	135.00	135.00	135.00	135.00

† The switching charge for delivery to foundries in the Chicago district is \$1 per ton.  
‡ For carlots at seaboard.

Scrap:	Aug. 12, 1947	Aug. 5, 1947	July 15, 1947	Aug. 13, 1946
(per gross ton)				
Heavy melt'g steel, P'gh. . . . .	\$41.50	\$42.75	\$38.75	\$20.00
Heavy melt'g steel, Phila. . . . .	39.50	40.50	37.75	18.75
Heavy melt'g steel, Ch'go . . . . .	40.25	41.75	36.75	18.75
No. 1, hy. comp. sheet, Det. . . . .	37.50	37.50	34.00	17.32
Low phos. Youngs'n . . . . .	43.50	46.50	43.25	22.50
No. 1, cast, Pittsburgh . . . . .	41.50	41.50	38.25	20.00
No. 1, cast, Philadelphia . . . . .	48.50	48.50	34.00	20.00
No. 1, cast, Chicago . . . . .	51.25	51.25	45.50	20.00

Coke, Connellsville:	Aug. 12, 1947	Aug. 5, 1947	July 15, 1947	Aug. 13, 1946
(per net ton at oven)				
Furnace coke, prompt . . . . .	\$12.00	\$12.00	\$12.00	\$7.50
Foundry coke, prompt . . . . .	13.75	13.75	13.75	8.50

Nonferrous Metals:	Aug. 12, 1947	Aug. 5, 1947	July 15, 1947	Aug. 13, 1946
(cents per pound to large buyers)				
Copper, electro., Conn. . . . .	21.50	21.50	21.50	14.375
Copper, Lake, Conn. . . . .	21.625	21.625	21.625	14.375
Tin, Straits, New York . . . . .	80.00	80.00	80.00	52.00
Zinc, East St. Louis . . . . .	10.50	10.50	10.50	8.25
Lead, St. Louis . . . . .	14.80	14.80	14.80	8.10
Aluminum, virgin . . . . .	15.00	15.00	15.00	15.00
Nickel, electrolytic . . . . .	37.67	37.67	37.67	35.00
Magnesium, ingot . . . . .	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex. . . . .	33.00	33.00	33.00	14.50

In accordance with usual practice, THE IRON AGE finished steel composite price has been revised this week, following receipt of second quarter 1947 shipment data. While no price changes have been made since Aug. 5, 1947, the change in the pattern of shipments produces a composite price slightly higher than that of 3.17956¢, the figure used last week which was based on first quarter 1947 shipments. Shipment data by American Iron & Steel Institute.

# Composite Prices . .

FINISHED STEEL	
Aug. 12, 1947 . . . . .	3.19141¢ per lb. . . . .
One week ago . . . . .	3.19141¢ per lb. . . . .
One month ago . . . . .	2.88239¢ per lb. . . . .
One year ago . . . . .	2.70711¢ per lb. . . . .

HIGH		LOW	
1947 . . . . .	3.19141¢ Aug. 5	2.87118¢ Jan. 7	
1946 . . . . .	2.83599¢ Dec. 31	2.54490¢ Jan. 1	
1945 . . . . .	2.44104¢ Oct. 2	2.38444¢ Jan. 2	
1944 . . . . .	2.30837¢ Sept. 5	2.21189¢ Oct. 5	
1943 . . . . .	2.29176¢	2.29176¢	
1942 . . . . .	2.28249¢	2.28249¢	
1941 . . . . .	2.43078¢	2.43078¢	
1940 . . . . .	2.30467¢ Jan. 2	2.24107¢ Apr. 16	
1939 . . . . .	2.35367¢ Jan. 3	2.26689¢ May 16	
1938 . . . . .	2.58414¢ Jan. 4	2.27207¢ Oct. 18	
1937 . . . . .	2.58414¢ Mar. 9	2.32263¢ Jan. 4	
1936 . . . . .	2.32263¢ Dec. 28	2.05200¢ Mar. 10	
1935 . . . . .	2.07642¢ Oct. 1	2.06492¢ Jan. 8	
1934 . . . . .	2.15367¢ Apr. 24	1.95757¢ Jan. 2	
1933 . . . . .	1.95578¢ Oct. 3	1.75836¢ May 2	
1932 . . . . .	1.89196¢ July 5	1.83901¢ Mar. 1	
1931 . . . . .	1.99626¢ Jan. 13	1.86586¢ Dec. 29	
1930 . . . . .	2.25488¢ Jan. 7	1.97319¢ Dec. 9	
1929 . . . . .	2.31773¢ May 28	2.26498¢ Oct. 29	

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue.

PIG IRON	
Aug. 12, 1947 . . . . .	\$36.52 per gross ton . . . . .
One week ago . . . . .	\$36.88 per gross ton . . . . .
One month ago . . . . .	\$33.43 per gross ton . . . . .
One year ago . . . . .	\$28.13 per gross ton . . . . .

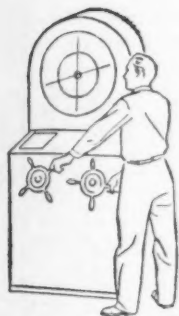
Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

SCRAP STEEL	
Aug. 12, 1947 . . . . .	\$40.42 per gross ton . . . . .
One week ago . . . . .	\$41.67* per gross ton . . . . .
One month ago . . . . .	\$37.75 per gross ton . . . . .
One year ago . . . . .	\$19.17 per gross ton . . . . .

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago. \* Revised.



# Robin Hood would have loved these...



Arrows whose shafts are made from steel tubes! Matched in weight to within two grains, matched for 'spine' or stiffness to within thousandths of an inch—straight as a sunbeam—these steel-tube-shafted arrows are perfection in archery. Globe Steel tubes Co.

doesn't make these arrows—but we do make steel tubes of such exceptional structural and metallurgical uniformity

and quality they might readily be used for arrow shafts.

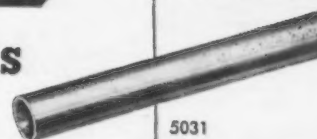
Your need in steel tubes may be wholly different from this application but whatever your requirements in carbon, alloy, stainless (seamless or *Gloweld* welded) and high purity ingot iron (*Globeiron*) tubes — look to Globe as a specialized, dependable source of supply. Globe engineers and technicians gladly cooperate to help you find exactly the tubing you need for even the most unusual application. Globe Steel Tubes Co., Milwaukee 4, Wisconsin.



## GLOBE

### STEEL TUBES

Seamless Tubes—Carbon—Alloy—Stainless Steels; *Gloweld* Welded Stainless Steel Tubing; *Globeiron* High Purity Ingot Iron Seamless Tubes; Mechanical Tubing—Pressure Tubing—Tubing for Corrosion and Heat Resisting Applications.



# Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points in cents per pound or dollars per gross ton. Extras apply. Delivered prices do not reflect 3 pct tax on freight. Industry practice has discontinued arbitrary f.o.b. prices at Gulf and Pacific Ports. Space limitations prevent quotation of delivered prices at major ports. (1) Commercial quality sheet grade; primes, 25c above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 20,000 lb to 89,999 lb. (9) Carload lot in manufacturing trade. (10) Delivered Los Angeles only. (11) Boxed. (12) Produced to dimensional tolerances in AISI Manual Sec. 6. (13) Delivered San Francisco only: Includes 3 pct freight tax. (14) Delivered Kaiser Co. prices: Includes 3 pct freight tax. (15) to 0.035 to 0.075 in. thick by  $\frac{1}{4}$  to  $3\frac{1}{2}$  in. wide. (16) Spot market as high as \$92 gross ton. (17) Delivered Los Angeles: add  $\frac{1}{2}$ c per 100 lb for San Francisco. (18) Slab prices subject to negotiation in most cases. Some producers charge (19) \$5 more, (20) \$3 more, (21) \$1 more. Some producers charge (22) 0.05c less, (23) 0.10c less, (24) 0.20c less.

Basing Points	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio	San Francisco, Los Angeles, Seattle	DELIVERED TO		
												Detroit	New York	Philadelphia
<b>INGOTS</b>														
Carbon, re-rolling														
Carbon, forging	\$46.00													
Alloy	\$56.00													
<b>BILLETS, BLOOMS, SLABS</b>														
Carbon, re-rolling <sup>18</sup>	\$45.00 <sup>19</sup>	\$45.00 <sup>19</sup>	\$45.00 <sup>19</sup>	\$50.00	\$45.00 <sup>19</sup>	\$45.00 <sup>19</sup>	\$50.00					\$48.00 <sup>19</sup>		
Carbon, forging billets	\$55.00 <sup>20</sup>	\$55.00 <sup>20</sup>	\$55.00 <sup>20</sup>	\$58.00	\$55.00 <sup>20</sup>	\$55.00 <sup>20</sup>	\$58.00					\$58.00 <sup>20</sup>		
Alloy	\$66.00	\$66.00				\$66.00						\$69.00		
<b>SHEET BARS<sup>16</sup></b>							\$59.00							
<b>PIPE SKELP</b>	2.60¢ <sup>21</sup>	2.65¢					2.60¢ <sup>21</sup>	2.60¢ <sup>21</sup>						
<b>WIRE RODS</b>	2.90¢ <sup>21</sup>	2.80¢ <sup>21</sup>		2.80¢ <sup>21</sup>	2.85¢							3.52¢ <sup>13</sup>		
<b>SHEETS</b>														
Hot-rolled	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	3.175¢	(Ashland, Ky. = 2.80¢)	3.54 <sup>17</sup> ¢	2.95¢	3.09¢	3.00¢
Cold-rolled <sup>1</sup>	3.55¢	3.55¢	3.55¢	3.55¢		3.55¢	3.55¢		3.65¢	3.55¢		3.70¢	3.96¢	3.93¢
Galvanized (10 gage)	3.95¢ <sup>23</sup>	3.95¢ <sup>23</sup>	3.95¢ <sup>23</sup>		3.95¢ <sup>23</sup>		3.95¢	3.95¢	4.05¢	3.95¢	4.62¢ <sup>17</sup>	4.14¢	4.05¢	
Enameling (12 gage)	3.95¢ <sup>22</sup>	3.95¢ <sup>22</sup>	3.95¢ <sup>22</sup>	3.95¢			3.95¢		4.05¢	3.95¢		4.10¢ <sup>22</sup>	4.35¢	4.33¢
Long ternes <sup>2</sup> (10 gage)	4.05¢ <sup>24</sup>	4.05¢	4.05¢ <sup>24</sup>										4.45¢	4.41¢
<b>STRIP</b>														
Hot-rolled <sup>3</sup>	2.80¢	2.80¢	2.80¢	2.80¢ <sup>15</sup>	2.80¢		2.80¢					3.60¢ <sup>17</sup>	2.95¢	3.23¢
Cold-rolled <sup>4</sup>	3.55¢	3.65¢		3.55¢			3.55¢					3.70¢	3.96¢	3.93¢
Cooperage stock	3.10¢	3.10¢			3.10¢		3.10¢						3.39¢	
<b>TINPLATE</b>														
Standard cokes, base box	\$5.75	\$5.75	\$5.75		\$5.85			\$5.85	\$5.85			(Warren, Ohio = \$5.75)	\$6.175	\$6.062 <sup>11</sup>
(0.25 lb. Electro, box 0.50 lb. 0.75 lb.)														
<b>BLACKPLATE, 29 gage<sup>5</sup></b>	3.90¢	3.90¢	3.90¢		4.00¢			4.00¢	4.00¢				4.29¢	4.20¢
<b>BLACKPLATE, CANMAKING</b>														
55 lb. to 70 lb. 75 lb. to 95 lb. 100 lb. to 118 lb.														
<b>TERNES, MFG., Special coated</b>														
<b>BARs</b>														
Carbon steel	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢					3.625¢ <sup>17</sup>	3.05¢	3.31¢
Rail steel <sup>6</sup>														
Reinforcing (billet) <sup>7</sup>	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢				3.325¢ <sup>17</sup>	3.04¢	2.95¢
Reinforcing (rail)														
Cold-finished <sup>8</sup>	3.55¢	3.55¢	3.55¢	3.55¢		3.55¢						3.70¢	3.96¢	3.93¢
Alloy, hot-rolled	3.30¢	3.30¢				3.30¢	3.30¢					3.45¢		3.44¢
Alloy, cold-drawn	4.10¢	4.10¢	4.10¢	4.10¢		4.10¢						4.25¢		
<b>PLATE</b>														
Carbon steel <sup>12</sup>	2.95¢	2.95¢	2.95¢	2.95¢	2.95¢		2.95¢					3.76¢ <sup>14</sup>		3.15¢
Floor plates	4.20¢	4.20¢											4.60¢	4.58¢
Alloy	3.80¢	3.80¢											4.02¢	3.895¢
<b>SHAPES, Structural</b>	2.80¢	2.90¢	2.80¢		2.80¢	2.80¢						3.43¢ <sup>10</sup>	3.00¢	2.94¢
<b>SPRING STEEL, C-R</b>														
0.26 to 0.40 carbon	3.20¢			3.20¢										
0.41 to 0.60 carbon	4.70¢			4.70¢										
0.61 to 0.80 carbon	5.30¢			5.30¢										
0.81 to 1.00 carbon	6.80¢			6.80¢										
Over 1.00 carbon	9.10¢			9.10¢										
<b>MANUFACTURERS' WIRE<sup>9</sup></b>														
Bright	3.55¢	3.55¢		3.55¢	3.55¢							4.56¢ <sup>13</sup>	3.96¢	3.93¢
Galvanized														
Spring (high carbon)	4.60¢	4.60¢		4.60¢								5.28¢ <sup>13</sup>	4.66¢	4.595¢
<b>PILING, Steel sheet</b>	3.38¢	3.30¢				3.30¢							3.71¢	3.68¢



# PRICES

## CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

Basing Point	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 438	No. 442	No. 446
Ingot, Pgh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila.	Subject to negotiation		Subject to negotiation			
Slabs, Pgh, Chi, Canton, Balt, Phila, Reading, Ft. Wayne, Balt	Subject to negotiation		Subject to negotiation			
Slabs, Pgh, Chi, Canton, Balt, Phila, Reading	Subject to negotiation		Subject to negotiation			
Billets, Pgh, Chi, Canton, Watervliet, Syracuse, Balt	Subject to negotiation		Subject to negotiation			
Billets, forging, Pgh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Water, Syracuse, Ft. Wayne, Titusville	Subject to negotiation		Subject to negotiation			
Bars, h-r, Pgh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville	23.00	22.50	17.50	17.50	21.00	25.50
Bars, c-f, Pgh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet	27.50	26.00	20.50	21.00	24.50	30.00
Plates, Pgh, Middletown, Canton	27.50	26.00	20.50	21.00	24.50	30.00
Shapes, structural, Pgh, Chi	31.50	29.50	23.50	24.00	28.00	33.00
Sheets, Pgh, Chi, Middletown, Canton, Balt	27.50	26.00	20.50	21.00	24.50	30.00
Strip, h-r, Pgh, Chi, Reading, Canton, Youngstown	39.00	37.00	29.00	31.50	35.50	39.00
Strip, c-r, Pgh, Chi, Newark, N. J., Reading, Canton, Youngstown	25.50	23.50	18.50	19.00	25.00	30.00
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, Pgh, Newark, N. J., Phila, Ft. Wayne	32.50	30.50	24.00	24.50	30.00	35.00
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton	27.50	26.00	20.50	21.00	24.50	30.00
Rod, h-r, Syracuse	32.46	30.30	23.80	24.34	34.82	38.26
Tubing, seamless, Pgh, Chi, Canton (4 to 6 in.)	27.05	25.97	20.02	20.56	24.34	29.75
	72.09	72.09	.....	68.49	.....	.....

## TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. \*Also Canton, Ohio)

W	Cr	V	Mo	Co	Base Per lb
18	4	1	—	—	82c
18	4	1	—	5	\$1.29
18	4	2	—	—	93c
1.5	4	1.5	8	—	59c
6	4	2	6	—	63c
High-carbon-chromium*					47c
Oil hardening manganese*					26c
Special carbon*					24c
Extra carbon*					20c
Regular carbon*					17c

Warehouse prices on and east of Mississippi are 2¢ per lb. higher; west of Mississippi, 4¢ higher.

## ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	Per lb
Field grade	4.50c
Armature	4.80c
Electrical	5.30c
Motor	6.05c
Dynamo	6.75c
Transformer 72	7.25c
Transformer 65	7.95c
Transformer 58	8.65c
Transformer 52	9.45c

F.o.b. Chicago and Gary, field grade through motor; f.o.b. Granite City, add 10¢ per 100 lb on field grade to and including dynamo.

## RAILS, TRACK SUPPLIES

(F.o.b. mill)

Standard rails, heavier than 60 lb	
No. 1 O.H., per 100 lb	\$2.75
Angle splice bars, 100 lb	3.25
(F.o.b. basing points) per 100 lb	
Light rails (from billets)	\$3.10
Light rails (from rail steel), f.o.b. Williamsport, Pa.	3.45

Base per lb

Cut spikes	4.85c
Screw spikes	6.90c
Tie plate, steel	3.05c
Tie plates, Pittsburg, Calif.	3.20c
Track bolts	7.00c
Track bolts, heat treated, to rail roads	7.25c

Basing points, light rails, Pittsburgh, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio; Weirton, W. Va.; St. Louis, Kansas City, Minn., Colo.; Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa.; Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa.; Richmond.

## ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

20x14 in. 20x28 in.	
8-lb coating I.C.	\$7.05 \$14.10

## CLAD STEEL

Base prices, cents per pound

	Plate	Sheet
Stainless-clad		
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Coatesville, Pa.	*24.00	*22.00
Nickel-clad		
10 pct, f.o.b. Coatesville, Pa.	21.50	.....
Inconel-clad		
10 pct, f.o.b. Coatesville..	30.00	.....
Monel-clad		
10 pct, f.o.b. Coatesville..	29.00	.....
Aluminized steel		
Hot dip, 20 gage, f.o.b. Pittsburgh	.....	9.00

\*Includes annealing and pickling, or sandblasting.

## MERCHANT WIRE PRODUCTS

To the dealer f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Base Delivered per 100 lb	San Francisco
Standard & coated nails	\$4.25†	\$5.33
Galvanized nails††	4.00†	5.08
Cut nails, carloads, Pittsburgh base	5.80*	.....

†10¢ additional at Cleveland, 35¢ at Worcester. ††Plus \$2.75 per 100 lb galvanizing extra. \*Less 20¢ to jobbers.

	Base per 100 lb	San Francisco
Annealed fence wire	\$4.20†	\$5.21
Annealed galv. fence wire	4.65†	5.66
†10¢ additional at Worcester.		
To the dealer f.o.b. Pittsburgh, Chicago, Birmingham		

	Base column	
Woven wire fence*	91	114
Fence posts, carloads...	90††	...
Single loop bale ties	91	115
Galvanized barbed wire**	101	121
Twisted barless wire...	101	...

\*15% gage and heavier. \*\*On 30-rod spools in carload quantities. ††Pittsburgh, Duluth.

## HIGH STRENGTH, LOW ALLOY STEELS

base prices, cents per pound

Steel	Aldor	Corten	Double Strength No. 1	Dynalloy	Hi Steel	Mayari R	Otiscoloy	Yoloy	NAX High Tensile
Producer	Repub-lic	Carnegie-Illinois, Republic	Repub-lic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Steel
Plates.....	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55
Sheets									
Hot-rolled...	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
Cold-rolled...	5.30	5.30	5.30	.....	5.30	5.30	5.30	5.30	5.30
Galvanized...	.....	5.85	.....	.....	.....	6.00	.....	.....	.....
Strip									
Hot-rolled...	4.30	4.30	4.30	.....	4.30	4.30	4.30	4.30	4.30
Cold-rolled...	.....	.....	5.30	.....	.....	5.30	5.30	5.30	5.30†
Shapes.....	.....	4.30	.....	.....	4.30	4.30	4.30	4.30	.....
Beams.....	.....	4.30	.....	.....	.....	4.30	.....	.....	.....
Bars									
Hot-rolled...	4.45	4.45	4.45	.....	.....	4.45	4.45	4.45	4.45
Cold-rolled...	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bar shapes.....	.....	4.45	.....	.....	4.45	4.45	4.45	4.45	.....

† Pittsburgh, add 0.10¢ at Chicago and Gary.

## PIPE AND TUBING

Base discounts, f.o.b. Pittsburgh and Lorain, steel butt weld and seamless. Others f.o.b. Pittsburgh only. Base price, \$200.00 per net ton

## Standard, threaded &amp; coupled

Steel, butt weld	Black	Galv.
1/2-in. ....	50 1/2	34 1/2
3/4-in. ....	53 1/2	38 1/2
1-in. ....	56	41 1/2
1 1/4-in. ....	56 1/2	42
1 1/2-in. ....	57	42 1/2
2-in. ....	57 1/2	43
2 1/2 and 3-in. ....	58	43 1/2

## Wrought Iron, butt weld

1/2-in. ....	+ 7	+ 29
3/4-in. ....	2 1/2	+ 19
1 and 1 1/4-in. ....	8	+ 11
1 1/2-in. ....	13 1/2	+ 7 1/2
2-in. ....	14	+ 7

## Steel, seamless

2-in. ....	48	33
2 1/2 and 3-in. ....	51	36
3 1/2 to 6-in. ....	53	38

## Wrought Iron, lap weld

2-in. ....	5 1/2	+ 14 1/2
2 1/2 to 3 1/2-in. ....	8	+ 10 1/2
4-in. ....	12	+ 5
4 1/2 to 8-in. ....	10	+ 6 1/2

## Extra Strong, plain ends

Steel, butt weld		
1/2-in. ....	49 1/2	35
3/4-in. ....	53 1/2	39
1-in. ....	55 1/2	42
1 1/4-in. ....	56	42 1/2
1 1/2-in. ....	56 1/2	43
2-in. ....	57	43 1/2
2 1/2 and 3-in. ....	57 1/2	44

## Wrought Iron, butt weld

1/2-in. ....	+ 2 1/2	+ 23
3/4-in. ....	3 1/2	+ 17
1 to 2-in. ....	13	+ 7

## Steel, seamless

2-in. ....	47	33
2 1/2 and 3-in. ....	51	37
3 1/2 to 6-in. ....	52 1/2	40 1/2

## Wrought Iron, lap weld

2-in. ....	8 1/2	+ 11
2 1/2 to 4-in. ....	17 1/2	+ 1/2
4 1/2 to 6-in. ....	13	+ 5

Basing discounts for standard pipe are for threads and couplings. For threads only, butt weld, lap weld and seamless pipe, one point higher discount (lower price) applies. For plain ends, butt weld, lap weld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lap weld and seamless 3 1/2-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all butt weld. On butt weld and lap weld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

## BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft., f.o.b. Pittsburgh in carload lots, cut length 4 to 24 ft. inclusive.

OD in in.	Gage BWG	Hot-Rolled	Cold-Drawn
2	13	\$16.67	\$19.81
2 1/2	12	22.42	26.63
3	12	24.93	29.63
3 1/2	11	31.17	37.04
4	10	38.69	45.95

## CAST IRON WATER PIPE

	Per net ton
6-in. to 24-in. del'd Chicago	\$85.06
6-in. to 24-in. del'd New York	83.30
6-in. to 24-in., Birmingham	74.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles for all rail shipment; rail and water shipment less	98.50
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

## BOLTS, NUTS, RIVETS, SET SCREWS

## Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

## Machine and Carriage Bolts

Base discount less case lots

	Percent Off List
1/2 in. & smaller x 6 in. & shorter	48
9/16 & 5/8 in. x 6 in. & shorter	50
All larger diam and longer lengths	47
Lag, all diam over 6 in. long	48
Lag, all diam x 6 in. & shorter	50
Flow bolts	57

## Nuts, Cold Punched or Hot Pressed (Hexagon or Square)

1/2 in. and smaller	48
9/16 to 1 in. inclusive	47
1 1/4 to 1 1/2 in. inclusive	45
1 1/2 in. and larger	40

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

## Semifin. Hexagon Nuts USS SAE

Base discount less case lots

7/16 in. and smaller	51
1/2 in. and smaller	50
1/2 in. through 1 in.	48
9/16 in. through 1 in.	49
1 1/4 in. through 1 1/2 in.	47
1 1/2 in. and larger	40

In full case lots, 15 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

## Stove Bolts

Consumer Packages, nuts separate . . . 65 and 10

In bulk . . . 75  
On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

## Large Rivets

	(1/2 in. and larger)	Base per 100 lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham		\$5.25
F.o.b. Lebanon, Pa.		5.40

## Small Rivets

	(7/16 in. and smaller)	Percent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham		55 and 5

## Cap and Set Screws

	Percent Off List	Consumer
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	56	
1/2 to 1 in. x 6 in., SAE 1035, heat treated	47	
Set screws, cup and oval points	61	
Milled studs	33	
Flat head cap screws, listed sizes	21	
Fillister head cap, listed sizes	40	
Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.		

## FLUORSPAR

Metallurgical grade, f.o.b. producing plant.

Effective CaF <sub>2</sub> Content:	Base price per short ton
70% or more	\$33.00
65% but less than 70%	32.00
60% but less than 65%	31.00
Less than 60%	30.00

## LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer	\$5.95
Old range, nonbessemer	5.80
Mesaabi, bessemer	5.70
Mesaabi, nonbessemer	5.65
High phosphorus	5.55
Prices quoted retroactive to Jan. 1, 1947.	

## METAL POWDERS

Prices in cents per pound in ton lots, f.o.b. shipping point.

Brass, minus 100 mesh	24¢ to 28 1/2¢
Copper, electrolytic, 100 and 325 mesh	30¢ to 31 1/2¢
Copper, reduced, 150 and 200 mesh	29¢ to 30 1/2¢
Iron, commercial, 100, 200, 325, mesh 96 + % Fe carlots	10¢ to 15¢
Swedish sponge iron, 100 mesh, c.i.f. N. Y., carlots, ocean bags	7.4¢ to 8.5¢
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots	5¢
Iron, hydrogen reduced, 300 mesh and finer, 98 + % Fe, drum lots	63¢ to 80¢
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe	35¢ to 37¢
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe	29¢ to 31¢
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe	90¢ to 1.75
Aluminum, 100, 200 mesh, carlots	23¢ to 26¢
Antimony, 100 mesh	36.05¢
Cadmium, 100 mesh	\$2.00
Chromium, 100 mesh and finer	\$1.025
Lead, 100, 200, & 300 mesh 18.50¢	to 23.50¢
Manganese, minus 325 mesh and coarser	49¢
Nickel, 150 mesh	51 1/4¢
Silicon, 100 mesh	26¢
Solder powder, 100 mesh	3 1/4¢ plus metal
Stainless steel, 302, minus 100 mesh	75¢
Tin, 100 mesh	90¢
Tungsten metal powder, 98% 99%, any quantity, per lb.	\$3.05
Molybdenum powder, 99%, in 100-lb kegs, f.o.b. York, Pa., per lb.	\$2.65
Under 100 lb	\$2.90

## COKE

	Net Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	\$11.50 to \$12.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	13.00 to 14.50
Foundry, Byproduct	
Chicago, del'd	\$17.10
Chicago, f.o.b.	16.10
New England, del'd	17.25
Seaboard, Kearney, N. J., f.o.b.	17.85
Philadelphia, f.o.b.	16.75
Swedeland, Pa., f.o.b.	16.75
Buffalo, del'd	18.25
Ashland, Ohio, f.o.b.	14.50
Painesville, Ohio, f.o.b.	14.60
Erle, del'd	16.75
Cleveland, del'd	15.90
Cincinnati, del'd	15.39
St. Louis, del'd	18.03
Birmingham, del'd	15.00

## REFRACTORIES

(F.o.b. Works)

## Fire Clay Brick

	Carloads, Per 1000
No. 1, Ohio	\$64.00
First quality, Pa., Md., Ky., Mo., Ohio	70.00
First quality, New Jersey	75.00
Sec. quality, Pa., Md., Ky., Mo., Ohio	64.00
Sec. quality, New Jersey	54.00
No. 2, Ohio	56.00
Ground fire clay, net ton, bulk	10.00

## Silica Brick

Pennsylvania and Birmingham	\$70.00
Chicago District and Alabama	79.00
Silica cement, net ton (Eastern)	12.00
East Chicago	13.00

## Chrome Brick

	Per Net Ton
Standard chemically bonded, Balt., Plymouth Meeting, Chester	\$59.00

## Magnesite Brick

Standard, Balt. and Chester	\$81.00
Chemically bonded, Baltimore	70.00

## Grain Magnesite

Domestic, f.o.b. Balt. and Chester in bulk	\$44.50
Domestic, f.o.b. Chewelah, Wash., in bulk	24.00
in sacks	26.00
Clinker (dead burned) dolomite, bulk, per net ton, f.o.b. Billmeyer, Pa., Millersville, Ohio	10.55
Midwest, add 10¢; Mo. Valley, add 20¢	



# PRICES

## WAREHOUSE PRICES

Base prices, delivered metropolitan areas, per 100 lb.

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia.....	\$3.99	\$5.18	\$5.29	\$4.43	\$5.28	\$4.44	\$4.22	\$4.48	\$5.13	\$8.37	\$8.37	\$9.88	\$9.88
New York.....	4.67	5.67 <sup>1</sup>	6.07	4.97	5.45	5.02	4.72	5.12	5.52	8.42	8.42	9.92	9.92
Boston.....	4.40	5.22	4.95 <sup>12</sup>	4.65	5.36	4.70	4.47	4.82	5.22	8.62	8.62	9.97	9.97
Baltimore.....	3.99	.....	5.14	4.40	.....	4.39	4.34	4.45	5.10	.....	.....	.....	.....
Norfolk.....	4.15	.....	.....	.....	.....	4.50	4.50	4.75	5.50	.....	.....	.....	.....
Chicago.....	3.65	.....	.....	4.05	5.05	4.25	4.10	4.10	4.75	8.10	8.10	9.35	9.35
Milwaukee.....	4.099	4.899 <sup>1</sup>	5.249	4.199	.....	4.399	4.249	4.249	4.899	8.399	8.399	9.649	9.649
Cleveland.....	3.95	4.55	5.238	4.188	.....	4.25 <sup>1</sup>	4.311	4.10	4.75	8.358	8.358	9.35	9.35
Buffalo.....	4.45	5.20 <sup>1</sup>	5.90	4.60	5.60	4.85	4.40	4.40	5.10	8.05	8.15	9.30	9.40
Detroit.....	4.05	4.85	5.42	4.34	5.24	4.49 <sup>1</sup>	4.42	4.20	4.87	8.51	8.51	9.74	9.74
Cincinnati.....	3.918	4.718	5.168	.....	.....	4.553	4.444	4.403	5.053	.....	.....	.....	.....
St. Louis.....	3.999	4.799 <sup>1</sup>	5.424	4.199	5.424	4.399	4.249	4.249	5.074	8.574	8.574	9.824	9.824
Pittsburgh.....	3.95	4.65 <sup>1</sup>	5.10	4.05	4.95	4.25	4.10	4.10	4.75	8.10	8.10	9.35	9.35
St. Paul.....	4.284 <sup>7</sup>	5.084 <sup>1</sup>	5.434 <sup>2</sup>	4.384 <sup>7</sup>	.....	4.584 <sup>7</sup>	4.434 <sup>7</sup>	4.434 <sup>7</sup>	5.478 <sup>6</sup>	.....	7.084 <sup>6</sup>	.....	.....
Omaha.....	4.768	6.118 <sup>1</sup>	5.918	4.868	.....	5.068	4.918	4.918	5.588	.....	.....	.....	.....
Indianapolis.....	3.84	4.84	5.29	4.24	5.01	4.51	4.38	4.58	5.01	.....	.....	.....	.....
Birmingham.....	4.45 <sup>11</sup>	.....	5.80	4.45 <sup>11</sup>	.....	4.65 <sup>11</sup>	4.40 <sup>11</sup>	4.40 <sup>11</sup>	5.58	.....	.....	.....	.....
Memphis.....	4.32 <sup>11</sup>	5.53 <sup>11</sup>	5.97	4.72 <sup>11</sup>	.....	4.92 <sup>11</sup>	4.67 <sup>11</sup>	4.67 <sup>11</sup>	5.78	.....	.....	.....	.....
New Orleans.....	*4.68 <sup>11</sup>	5.94 <sup>1</sup>	.....	4.88 <sup>11</sup>	.....	5.03 <sup>11</sup>	*4.73 <sup>11</sup>	*4.83 <sup>11</sup>	5.94 <sup>6</sup>	.....	.....	.....	.....
Houston.....	4.90	.....	6.55	6.00	.....	5.00	5.85	5.00	6.25	.....	.....	.....	.....
Los Angeles.....	5.15	7.00 <sup>1</sup>	6.70	5.55	8.35 <sup>5</sup>	5.10	5.20	5.10	6.90 <sup>14</sup>	10.15	9.35	11.05	11.05
San Francisco.....	4.70 <sup>8</sup>	6.30 <sup>8</sup>	6.45	5.20 <sup>8</sup>	.....	5.00 <sup>8</sup>	4.90 <sup>8</sup>	4.75 <sup>8</sup>	7.00 <sup>10</sup>	.....	.....	.....	.....
Seattle.....	4.80 <sup>4</sup>	6.75 <sup>2</sup>	6.30	5.30 <sup>4</sup>	.....	5.15 <sup>4</sup>	4.95 <sup>4</sup>	5.00 <sup>4</sup>	7.10 <sup>14</sup>	.....	9.50 <sup>6</sup>	.....	10.55 <sup>6</sup>
Portland.....	5.00 <sup>4</sup>	.....	6.25	5.50 <sup>4</sup>	.....	5.25 <sup>4</sup>	5.10 <sup>4</sup>	5.10 <sup>4</sup>	7.20	.....	9.30 <sup>6</sup>	.....	.....
Salt Lake City.....	5.65	.....	7.10	6.35	.....	5.70	5.85	5.95	7.00	.....	.....	.....	.....

## BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb;

strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 lb and over.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 999 lb; (5) 2000 lb and over; (6) 1000 lb

and over; (7) 400 to 14,999; (8) 400 lb and over; (9) 450 to 1499; (10) 500 to 999; (11) 400 to 3999; (12) 450 to 3749; (13) 400 to 1999; (14) 1500 and over.

\* Add 46¢ for sizes not rolled in Birmingham.

† Up to ¾ in. thick and 90 in. wide.

## PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight.

BASING POINT PRICES						DELIVERED PRICES (BASE GRADES)								
Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	
Bethlehem	37.00	37.50	38.00	38.50		Boston	Everett	\$0.50 Arb.		45.50	46.00			
Birdsboro	40.00	40.50	41.00	41.50	45.00	Boston	Steelton	4.82					46.82	
Birmingham	32.88	33.38				Brooklyn	Bethlehem	3.00	40.00	40.50	41.00	41.50		
Buffalo	35.50	36.00	36.50			Brooklyn	Birdsboro	3.90					48.50	
Chicago	35.50	36.00	36.50	37.00		Cincinnati	Birmingham	4.87	37.75	38.25				
Cleveland	35.50	36.00	36.50			Jersey City	Bethlehem	1.84	38.84	39.34	39.84	40.34		
Duluth	36.00	36.50	37.00	37.50		Jersey City	Birdsboro	2.33					47.33	
Erie	35.50	36.00	36.50	37.00		Los Angeles	Provo	5.94	42.94	43.44				
Everett		45.00	45.50			Manassas	Cleveland-Toledo	2.33	37.83	38.33	38.83	39.33		
Granite City	36.00	36.50	37.00			Philadelphia	Bethlehem	1.67	38.67	39.17	39.67	40.17		
Neville Island	36.00	36.50	36.50	37.00		Philadelphia	Swedeland	1.01	42.01	42.51	43.01	43.51		
Provo	37.00	37.50				Philadelphia	Birdsboro	1.49	41.49	41.99	42.49	42.99	46.49	
Sharpsville	36.00	36.50	36.50	37.00		Philadelphia	Steelton	2.15	39.15				44.15	
Steelton	37.00				42.00	San Francisco	Provo	5.94	42.94	43.44				
Struthers, Ohio	36.50					Seattle	Provo	5.94	42.94	43.44				
Swedeland	41.00	41.50	42.00	42.50		St. Louis	Granite City	0.75 Arb.	36.25	37.25	37.25			
Toledo	35.50	36.00	36.50	37.00										
Troy, N. Y.	37.00	37.50	38.00	38.50	42.00									
Youngstown	36.00	36.50	36.50	37.00										

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00

pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.35 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—\$45.50; f.o.b. Buffalo — \$46.75. Add \$1.25 per ton for each additional 0.50 pct Si, up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add \$1.00 per ton for 0.75

pct or more P. Bessemer ferrosilicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorous \$44.00 per gross ton, f.o.b. Lyles, Tenn. Delivered to Chicago, \$49.49. High phosphorous charcoal pig iron is not being produced.

# FERROALLOY PRICES

## Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockwood, Tenn.  
 Carload lots (bulk) .....\$135.00  
 Less ton lots (packed) ..... 157.00  
 Delivered Pittsburgh ..... 140.25  
 \$1.70 for each 1% above 82% Mn; penalty, \$1.70 for each 1% below 78%.  
 Briquets—Cents per pound of briquet, freight allowed, 66% contained Mn.  
 Eastern Central Western  
 Carload, bulk ... 7.00 7.25 7.80  
 Ton lots ..... 8.00 8.60 10.50  
 Less ton lots ... 8.40 9.00 10.90

## Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.  
 16-19% Mn 19-21% Mn  
 3% max. Si 3% max. Si  
 Carloads ..... \$46.00 \$47.00  
 F.o.b. Pittsburgh 50.00 51.00

## Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.  
 96% min. mn, 0.2% max. C, 1% max. Si, 2% max. Fe.  
 Carload, bulk ..... 30  
 L.c.l. lots ..... 32

## Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.  
 Carloads ..... 32  
 Ton lots ..... 34  
 Less ton lots ..... 36

## Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.  
 Carloads Ton Less  
 0.06% max. C, 0.06% P, 90% Mn ..... 21.00 22.10 22.70  
 0.10% max. C ..... 20.50 21.60 22.20  
 0.15% max. C ..... 20.00 21.10 21.70  
 0.30% max. C ..... 19.50 20.60 21.20  
 0.50% max. C ..... 19.00 20.10 20.70  
 0.75% max. C ..... 18.00 19.10 19.70  
 7.00% max. Si ..... 16.00 17.10 17.70

## Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.  
 Carload, bulk ..... 6.65  
 Ton lots ..... 7.70  
 Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet ..... 6.75  
 Ton lots ..... 7.75  
 Less ton lots ..... 8.15

## Silvery Iron (electric furnace)

Si 14.01 to 14.50%, \$69.00 f.o.b. Keokuk, Iowa; \$70.00 f.o.b. Niagara Falls. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add 50¢ per ton for each 0.50 pct Mn over 1 pct.

## Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.  
 Eastern Central Western  
 96% Si, 2% Fe. . 16.50 17.85 19.60  
 97% Si, 1% Fe. . 16.00 18.25 20.00

## Ferrosilicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si, 1 lb Si briquets.  
 Eastern Central Western  
 Carload, bulk .... 4.25 4.50 4.70  
 Ton lots ..... 5.25 5.85 6.15  
 Less ton lots .... 5.65 6.25 6.55

## Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.  
 Eastern Central Western  
 25% Si ..... 15.00 15.65 15.90  
 50% Si ..... 7.80 8.30 8.50  
 75% Si ..... 10.00 10.30 11.05  
 80-90% Si ..... 11.30 11.60 12.35  
 90-95% Si ..... 12.80 13.10 13.80

## Ferrochrome (65-72%Cr, 3% max. Si)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.  
 Eastern Central Western  
 0.06% C ..... 23.00 23.40 24.00  
 0.10% C ..... 22.50 22.90 23.50  
 0.15% C ..... 22.00 22.40 23.00  
 0.20% C ..... 21.75 22.15 22.25  
 0.50% C ..... 21.50 21.90 22.00  
 1.00% C ..... 21.00 21.40 21.50  
 2.00% C ..... 20.50 20.90 21.00  
 65-69% Cr, 4-9% C ..... 15.60 16.00 16.15  
 62-66% Cr, 4-6% C ..... 16.60 17.00 17.15  
 Briquets—Contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.  
 Eastern Central Western  
 Carload, bulk ..... 9.85 10.10 10.20  
 Ton lots ..... 10.75 11.65 12.25  
 Less ton lots .. 11.15 12.05 12.65

## High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

## S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.  
 High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.  
 Eastern Central Western  
 Carload ..... 16.70 17.10 17.25  
 Ton lots ..... 17.90 19.20 20.00  
 Less ton lots .. 18.60 19.90 20.70  
 Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.  
 Eastern Central Western  
 Carload ..... 21.00 21.40 21.50  
 Ton lots ..... 22.35 23.00 24.20  
 Less ton lots .. 23.35 24.00 25.20

## Chromium Metal

Contract prices, cents per lb, chromium contained, carload, f.o.b. shipping point, freight allowed, 97% min. Cr, 1% max. Fe.  
 Eastern Central Western  
 0.30% max. C. . 83.50 85.00 86.35  
 0.50% max. C. . 79.50 81.00 82.25  
 9.00% min. C. . 79.50 81.00 82.25

## Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.  
 30-35% Ca, 60-65% Si, 3.00% max. Fe or 28-32% Ca, 60-65% Si, 6.00% max. Fe.  
 Eastern Central Western  
 Carloads ..... 14.00 14.50 16.55  
 Ton lots ..... 16.10 16.85 19.00  
 Less ton lots .. 17.10 17.85 20.00

## Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.  
 16-20% Ca, 14-18% Mn, 53-59% Si.  
 Eastern Central Western  
 Carloads ..... 15.50 16.00 18.05  
 Ton lots ..... 17.60 18.45 20.20  
 Less ton lots .. 18.60 19.45 21.20

## Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.  
 Cast Turnings Distilled  
 Ton lots ..... \$1.60 \$2.35 \$2.95  
 Less ton lots .... 1.95 2.70 3.75

## CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.  
 Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.  
 Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.  
 Eastern Central Western  
 Ton lots ..... 16.00 17.10 19.05  
 Less ton lots .. 16.75 17.85 19.80

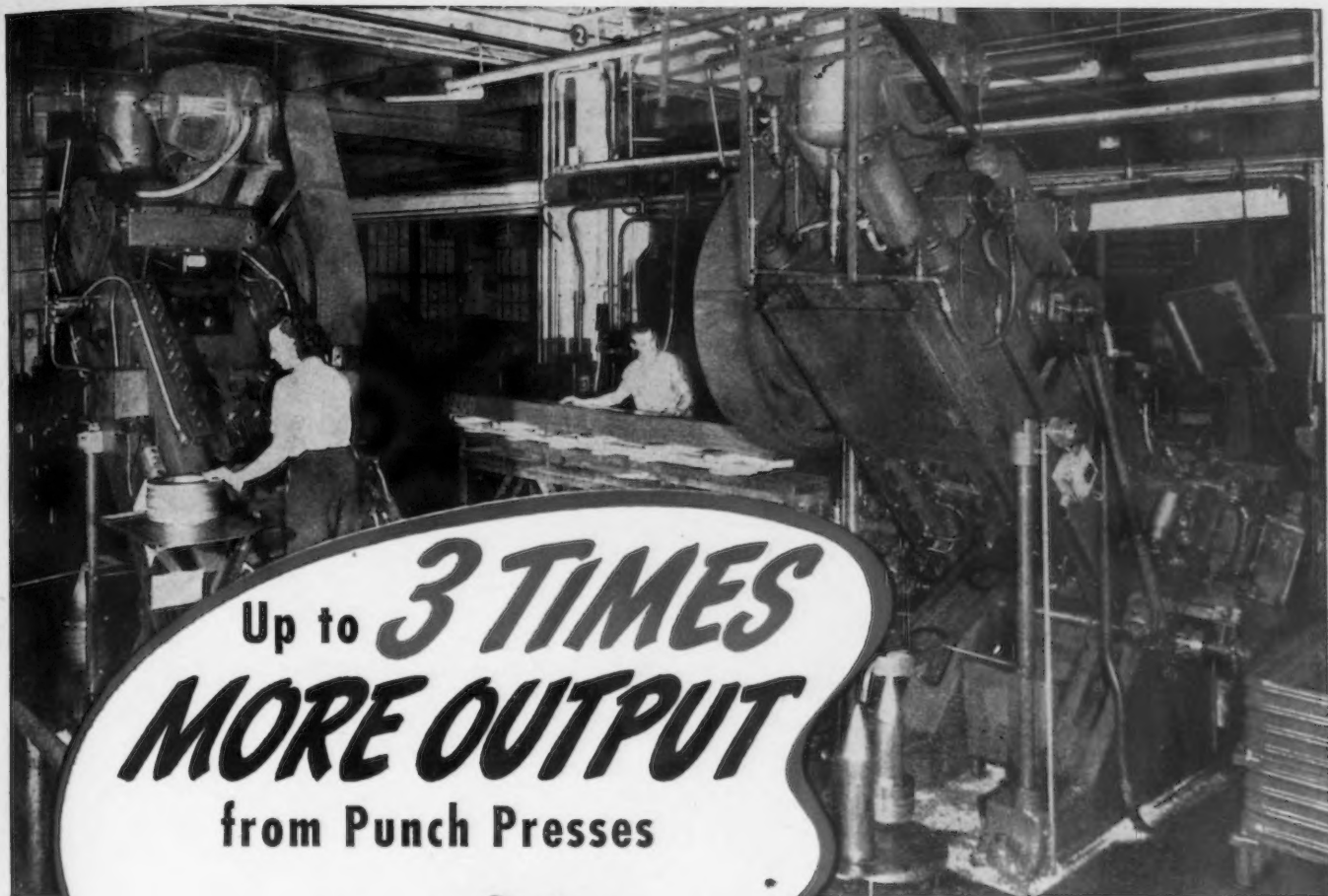
## SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.  
 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.  
 Eastern Central Western  
 Ton lots ..... 14.25 15.35 17.30  
 Less ton lots .. 15.00 16.10 18.05

## Other Ferroalloys

Ferrotungsten, standard, lump or ½ x down, packed, f.o.b. plant Niagara Falls, Washington, Pa. York, Pa., per pound contained W, 5 ton lots, freight allowed... \$2.50  
 Ferrovandium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.  
 Openhearth ..... \$2.70  
 Crucible ..... \$2.80  
 High speed steel (Primos)... \$2.90  
 Vanadium pentoxide, 88-92% V<sub>2</sub>O<sub>5</sub>, technical grade, contract basis, per pound contained V<sub>2</sub>O<sub>5</sub> ..... \$1.10  
 Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb  
 Ton lots ..... \$2.50  
 Less ton lots ..... \$2.55  
 Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo. .... 96¢  
 Calcium molybdate, 40-45%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo. .... 80¢  
 Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo. .... 80¢  
 Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo. .... 80¢  
 Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y. ton lots, per pound contained Ti ..... \$1.22  
 Less ton lots ..... \$1.35  
 Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti ..... \$1.35  
 Less ton lots ..... \$1.40  
 High carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton...\$142.50  
 Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. (Siglo) Tenn., \$3 unitage per gross ton \$65.00  
 Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.  
 Carload lots ..... 17.00¢  
 Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy  
 Carload, bulk ..... 5.50¢  
 Alsifer, 20% Al, 40% Si, 40% Ft, contract basis, f.o.b. Suspension Bridge, N. Y.  
 Carload ..... 6.50¢  
 Ton lots ..... 7.00¢  
 Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound  
 Car lots ..... 9.00¢  
 Ton lots ..... 9.75¢  
**Boron Agents**  
 Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.  
 Ferroboron, 17-50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.  
 Eastern Central Western  
 Less ton lots...\$1.30 \$1.8075 \$1.323  
 Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.  
 Ton lots ..... \$1.89 \$1.903 \$1.935  
 Less ton lots 2.01 2.023 2.044  
 Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.  
 Less ton lots...\$2.10 \$2.1125 \$2.1445  
 Silcaz, contract basis, f.o.b. plant freight allowed, per pound.  
 Carload lots ..... 35¢  
 Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.  
 No. 1 ..... 87.5¢  
 No. 6 ..... 60¢  
 No. 79 ..... 45¢  
 Bortram, f.o.b. Niagara Falls  
 Ton lots, per pound ..... 45¢  
 Less ton lots, per pound... 50¢  
 Carbortam, f.o.b., Suspension Bridge, N. Y., freight allowed, Ti 15-17%, B 0.90-1.15%, Si 2.5-3.0% Al 1.0-2.0%.  
 Ton lots, per pound ..... 8.0¢





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**MORE OUTPUT**  
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*With repeat-stroke operation, V★S makes possible 2 to 3 times greater production by providing adjustable speeds to suit a variety of materials and operating conditions.*

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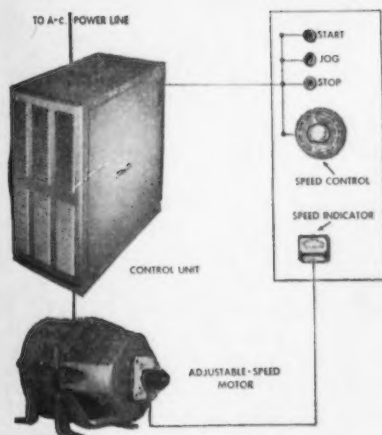
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V★S Drives are available from 1 to 200 hp.

**RELIANCE<sup>AC</sup> DC MOTORS**

*"Motor-Drive is More Than Power"*

## The New XACTLINE STRAIGHT LINE TEMPERATURE CONTROL

For Use With  
Pyrometer Controllers



Anticipates  
Temperature Change  
Eliminates Overshoot  
and Undershoot

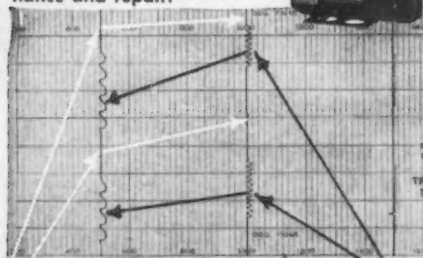
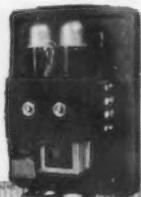
Now with XACTLINE Straight Line Temperature Control you can increase the efficiency of your Pyrometer Control Instruments (either Millivoltmeter or Potentiometer Type) to an amazing degree. Now you can hold tolerances as close as  $1/5^{\circ}\text{F}$ . plus or minus and power "on-off" cycles as low as 3 seconds.

For XACTLINE, operating in the thermocouple circuit, ANTICIPATES the most minute heat variations on both heating and cooling cycles, thereby enabling your pyrometer controller to control far more closely than otherwise possible.

This Anticipation Factor means that XACTLINE causes the conventional pyrometer controller to respond to a millivoltage impulse up to 90% less than that normally required, (the controlling pyrometer functions only when the desired temperature range has already been exceeded).

XACTLINE is laboratory tested and adjusted . . . does not require readjustment or coordination with other controllers.

NO gears, cams, shafts, bearings or other rotating or sliding parts. Simple design eliminates usual maintenance and repair.



**Xactline in Circuit      Pyrometer Only**

PRECISE CONTROL FOR . . . Tempering-Drawing . . . Iso-Thermal Quenching . . . Al and Mg Treatment . . . Accurate Heat Treating . . . Sintering . . . Metallic Baths . . . Plastic Molding . . . and other operations . . . Price complete F. O. B. Factory . . . **\$79.50**

Write for the new XACTLINE data folder today!

**GORDON  
SERVICE**

**CLAUDE S. GORDON CO.**

Specialists for 33 Years in the Heat Treating and Temperature Control Field

Dept. 16 • 3000 South Wallace St., Chicago 16, Ill.  
Dept. 16 • 7016 Euclid Avenue • Cleveland 3, Ohio

## Fatigue Cracks

BY C. T. POST

### Thin Dime

• • Sharon Steel's July 31 advertisement (p. 36) put a micrometer to a thin dime. Sharon's reading was 0.041 in., or somewhere between 19 and 20 gage if you could make dimes of alloy strip. We want to tell Sharon that this was an exceptionally thin dime—probably about an 1885 model—and should be called in. The U. S. Treasury spilled its heart to George Baker, Washington bird dog for your favorite family journal, on the entire matter of coinage. Treasury does not set thin or thick tolerances on dimes, but the prescribed thickness is .053 inches. If someone should ask you which is thicker, a quarter or a penny, the answer is a quarter—.067 inches as against .062 inches for a penny. A nickel is .078 inches, a half dollar is .086 inches, and, for you far Westerners, the silver dollar is .114 inches. Tolerance on the coins is by grain weight. The penny has a gross weight of 48 grains, plus or minus 2 grains; the nickel, 77.16 grains, with a three-grain tolerance; the dime, 38.58 grains, the quarter, 96.45 grains, the half dollar, 192.9 grains, and the dollar, 412.5 grains, each with a 1.5 grain tolerance. If you have any rejects in your change purse you can send them to us.

### Gray or Grey

• • We'd like some of our foundry experts to straighten us out, once and for all as to whether a *gray* iron casting is a *grey* iron casting, or vice versa. The American Foundrymen's Association seems to be pretty consistent on gray, and IRON AGE's brains department ducks the question, but uses gray. We thought, when we discovered the British using grey consistently, that we could toss in another international controversy to the United Nations. But last week we noticed an ad for The Wheland Co., Chattanooga, Tenn., sticking its chin out on grey. Now we're right back where we started. Will someone straighten us out? We're getting grey hairs.

### Prophetic

• • Bernie Herman, who keeps a bead on your favorite advertisers from Philadelphia, hands us a tear sheet from *Western Metals* with a story on a San Diego airplane plant. It's entitled "From Planes to Caskets." That sort of thing makes air travelers shudder.

### Quick As A Flash

"Pictured here at Portsmouth, N. H., is a Stevens-Duryea with acetylene gas lights which will do 45 mph without straining."—Photo Caption, THE IRON AGE, Aug. 7, 1947, p. 92.

"Velocity of light through atmosphere: 186,330 miles per second."—The Engineers Year-Book, 1942.

"Velocity of Light, 186,324 miles per second."—The World Almanac, 1947.

• • Through our dust goggles we always used to sort of fancy those 45 mph acetylene rays, straining or not. Even considering supersonic missiles and such, 186,330 miles per second for a 1942 model beam seems like real progress. But the 1947 post-war letdown of 6 miles per second really has us worried. Maybe the 1948 models will do better.

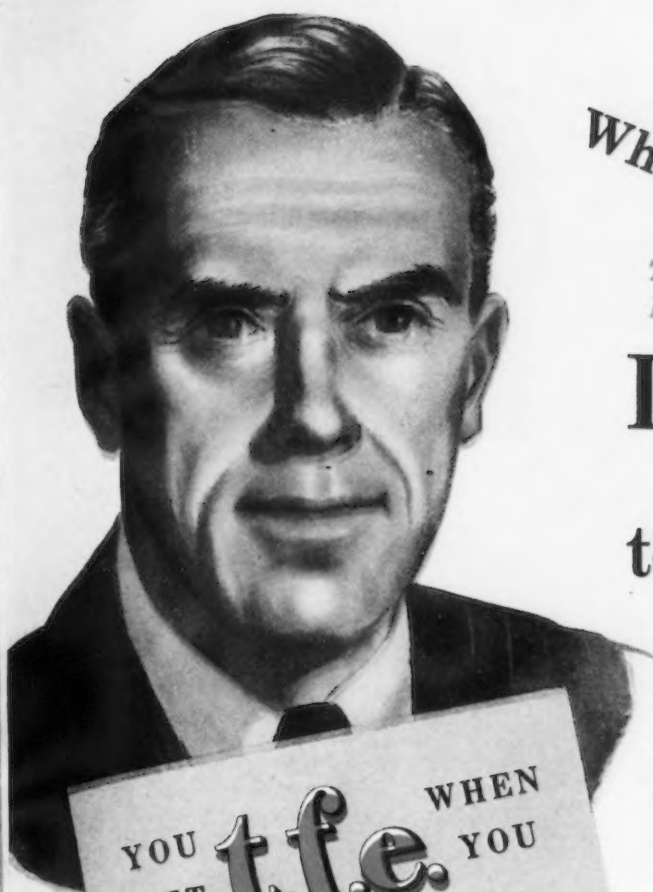
### Fiat Lux

• • Next to your favorite family journal itself, the reading matter we most enjoy are the checks that flood in to pay for subscriptions. Just when we were puffed up over one made out simply to "The World's Leading Metal-Working Journal," one came in yesterday payable to the "Board of Water & Light Commissioners." We were deflated over the implication that your f.f.j. was all wet until we happened to think of scorching light it sheds on metal-working problems. That melted our heart.

### Corsage

• • After our experience with Super Ponderosa Giants this year, we're kind of leery of seed advertisements. But a bulletin from the Director, South American No. 1, Botanical Experiment Station, Casilla 2220, Quito, Ecuador, makes our green thumb itch again. For a dime, he says, he will send a packet of orchid seeds with full instructions. Now if we could set aside a spot behind the file cabinets, and fertilize the sprouts regularly with coffee grounds or whatever they use, we might have a lure that would end the typist problem once and for all. Matter of fact, the bulletin shows a bathing girl sitting on one of the petals . . . but then the Super Ponderosa Giants didn't come out like the pictures, so we don't know.





## What do Fasteners Really Cost?

*There's more to fastener cost than just price.  
Lots more. Personally . . .*

I look for all 8  
to get **t.f.e.**

True  
Fastener  
Economy

YOU GET **t.f.e.** WHEN YOU

*It is the many costs of using a fastener that count . . . not just the initial price. True Fastener Economy is the lowest total cost for fastener selection, purchase, assembly and performance.*

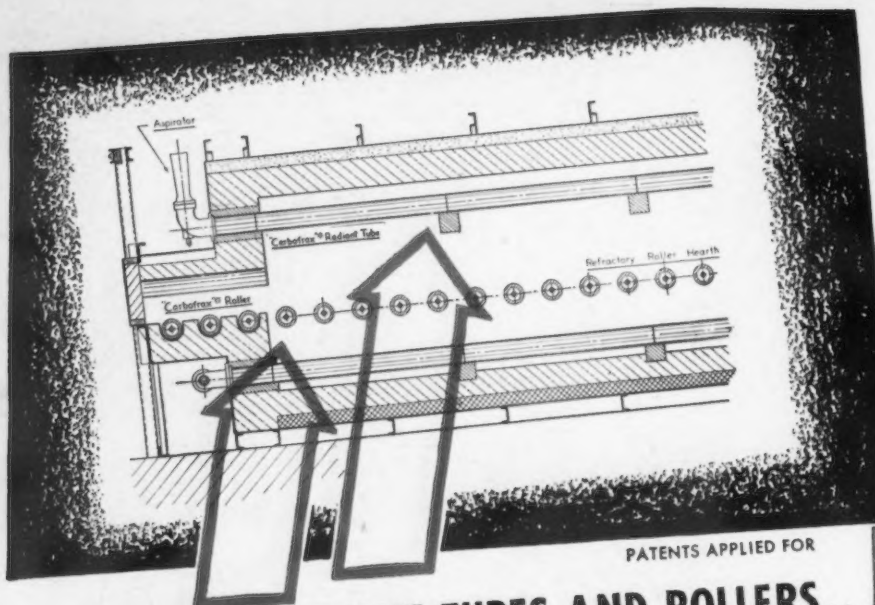
1. Reduce assembly time to a minimum by savings through use of accurate and uniform fasteners
2. Make your men happier by giving them fasteners that make their work easier
3. Reduce need for thorough plant inspection, due to confidence in supplier's quality control
4. Reduce the number and size of fasteners by proper design
5. Purchase maximum holding power per dollar of initial cost, by specifying correct type and size of fasteners
6. Simplify inventories by standardizing on fewer types and sizes of fasteners
7. Save purchasing time by buying larger quantities from one supplier's complete line
8. Contribute to sales value of final product by using fasteners with a reputation for dependability and finish

**RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY**

*102 years making strong  
the things that make America strong*

Plants at Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at Philadelphia, Detroit, Chicago, Chattanooga, Portland, Seattle. Distributors from coast to coast. By ordering through your distributor, you can get prompt service for your normal needs from his stocks. Also—the industry's most complete, easiest-to-use catalog.





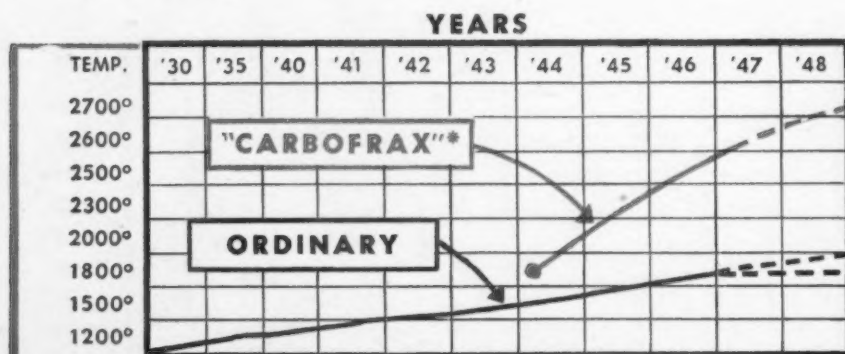
## NEW TYPE RADIANT TUBES AND ROLLERS.. REDUCE HEAT TREATING COSTS PROVIDE CONTROLLED ATMOSPHERES UP TO 2500° F. WITH GAS HEAT

"CARBOFRAX"\* Radiant Heating Tubes and Rollers are not only reducing heat treating costs in conventional furnace operations—but also achieving temperatures up to 2500° F. in special and protective atmospheres with radiant gas heat.

Laboratory tests and actual plant operation prove these outstanding advantages of "CARBOFRAX"\* Tubes and Rollers in GASMCO Industrial Furnaces:

- Lower initial cost—longer life
- Operation up to 2500° F.
- High heat transfer and fuel efficiency
- Low heat loss through insulated water cooling
- High hot load strength without oscillation
- Freedom from "crankshafting"
- Gas-tight operation

We shall be glad to send you complete information or arrange for an engineer to call.



Development of high operating temperatures with "CARBOFRAX"\* as compared with ordinary tubes and rollers. Because these high temperatures are economically practical, new fields are being opened in heat treating with gas fired roller hearth radiant tube furnaces.

\*"CARBOFRAX" is a registered trade-mark indicating manufacture by the Carborundum Company.

WRITE FOR  
FOLDER A-100

**THE GAS MACHINERY Company**

Designers and Fabricators of  
Industrial Heating and Handling  
Equipment • Manufactured Gas  
Plants and Special Equipment

16126 WATERLOO ROAD • CLEVELAND 10, OHIO

## Dear Editor:

### ALL-ALUMINUM HOUSE

Sir:

In the July 10 issue, in Newsfront, an item refers to a proposed prefabricated all-aluminum house. Would it be possible for us to get in contact with the prospective manufacturer of this product.

STUART GOURLEY  
Sales Manager

Calder Mfg. Co.  
Lancaster, Pa.

● Ivan Cummings, a University of Michigan Engineering College graduate, designed this house. He can be reached through the college at Ann Arbor.—Ed.

### BRICK FACING EQUIPMENT

Sir:

One of our export buyers who is a maker of insulating bricks is anxious to secure the name of manufacturers of a machine which is designed for the purpose of grinding automatically all six faces of a brick. This is not done simultaneously, but we understand the brick is transferred from one pair of wheels to another and then on to a third pair which completes the job. We would appreciate it if you would assist us in securing this information.

F. J. McMANN

Sun Machinery Corp.  
Newark, N. J.

● Machinery of this type is designed especially for the individual brick-making firms and there is no standard equipment on the market. A letter from a company describing the automatic grinding machinery which it uses has been mailed you.—Ed.

### TIN PLATE

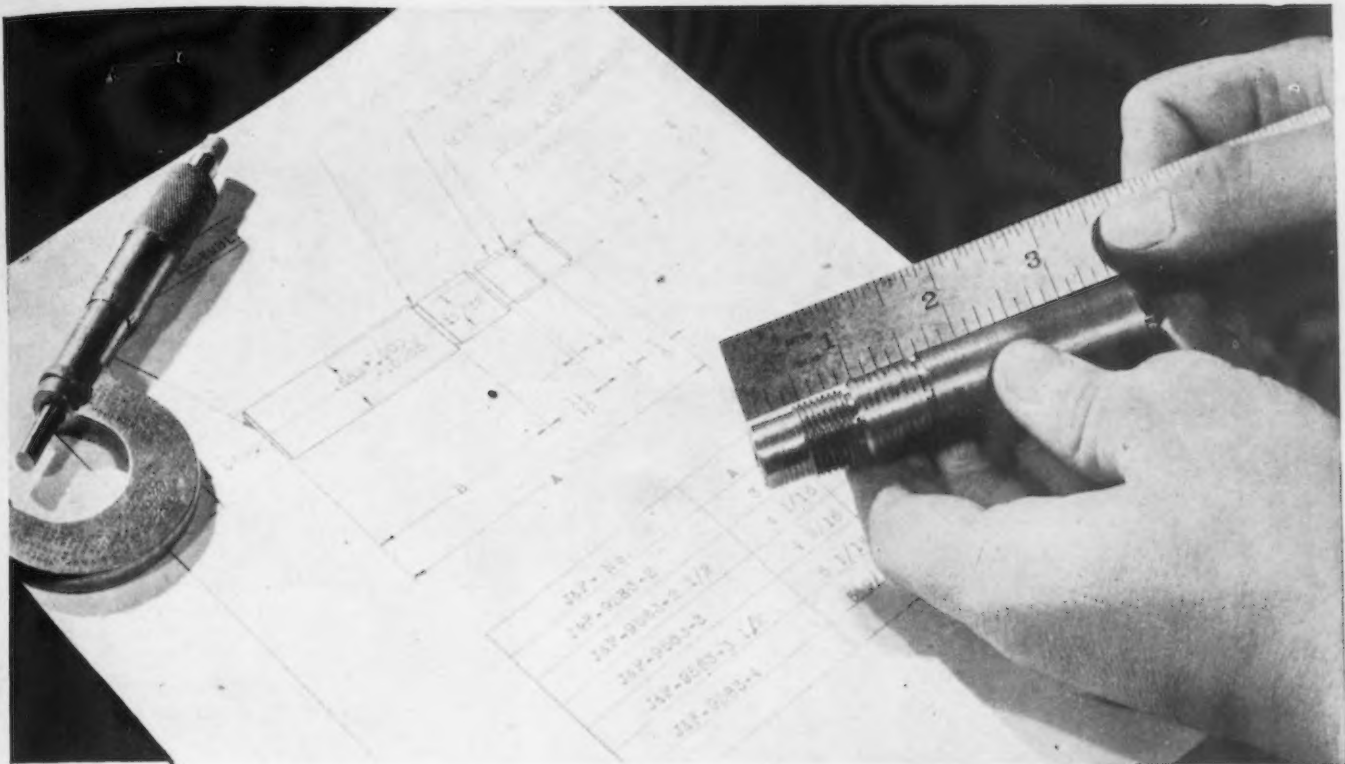
Sir:

We are large export shippers of various tin mill products. There seems to be considerable confusion between ourselves, our overseas offices, our suppliers, and even the testing laboratories, as to the descriptions and the specifications of the various grades of tin mill black plate and tin plate. It would be a great help to us if you could clarify this situation and tell us what are the various grades of these products which are currently produced, the descriptions and specifications of each of these grades, the defects in this material that are normally allowed in the various grades and how much, if any, rust may appear on the various grades of tin mill black plate. . . . While we are fully aware of the differences between coke tin plate and electrolytic tin plate, we are not quite clear about the respective uses of each type. . . .

ARTHUR GREENBLATT  
F. D'Hardy Inc.  
New York

● Information on specifications, defini-





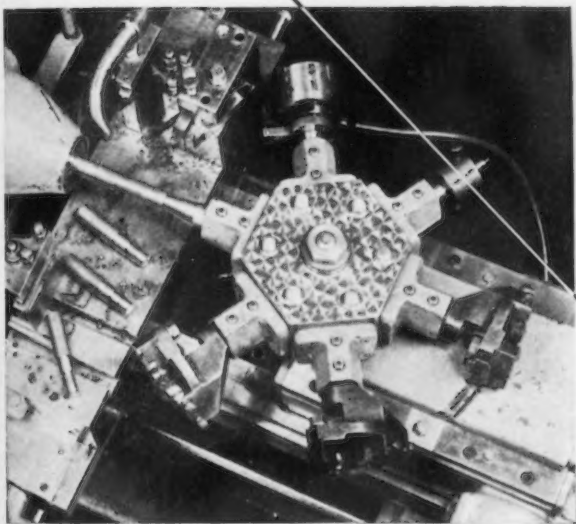
## 10 OPERATIONS...40 SECONDS

## COMPLETE

Here's a typical time-saving Speedi-Matic setup.

All six turret faces are used, plus four tools mounted in the rear block of the cross slide—and a cut-off in the front block. There are a total of ten cuts, requiring five spindle speeds. The slowest is 700 rpm, for threading, necking and chamfering. It's immediately preceded by the fastest; 2,000 rpm, for center drilling.

That's a lot of action for forty seconds—hardly possible without the Speedi-Matic's completely electronic controls. But it's mere routine operation on this revolutionary new hand screw machine, built to give you toolroom accuracy at production-line speed. Like more facts? Ask for bulletin 1901.

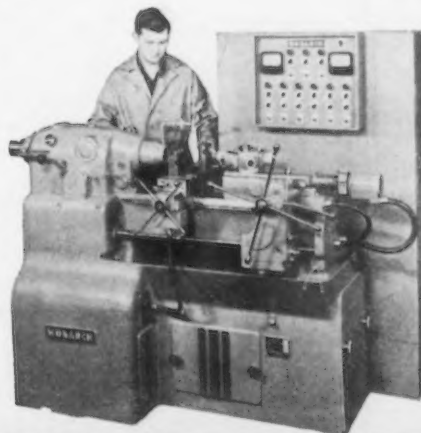


Part—Clamp Post; Material—X-1315 Steel; Preselected Spindle Speeds—5; Time per piece—40 seconds; Setup time—35 minutes.

### FOR PEAK PRODUCTION AT A PROFIT SPECIFY SPEEDI-MATIC

#### Here's what you get:

- Automatic electronic speed change, preselected for as many as nine stations.
- Automatic electronic feed change, preselected for as many as six stations.
- Complete range of spindle speeds—50 to 5,000 rpm.
- Feeds from  $\frac{1}{2}$ " to 16" per minute.
- Quick-acting, spring-return, hand-operated cut-off slide.
- Air-fed pusher-type collet attachment.
- Collet chuck capacity— $\frac{7}{8}$ ".



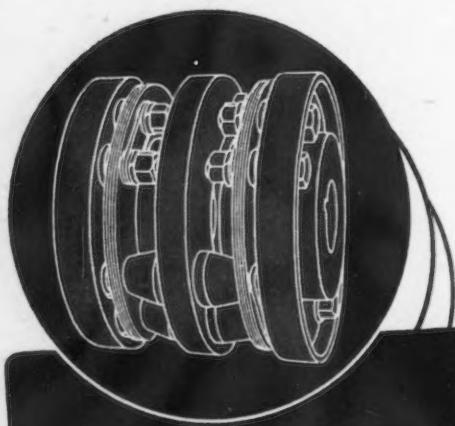
**MONARCH MACHINE TOOL CO. . . . Sidney, Ohio**

# THOMAS

## *Flexible* COUPLINGS

are specified by engineers wherever

100% dependability is demanded



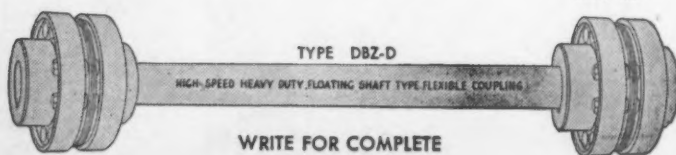
## THOMAS *Flexible* COUPLINGS

provide for  
Angular and Parallel  
Misalignment as well  
as Free End Float...

*and Eliminate*  
**BACKLASH, FRICTION,  
WEAR and CROSS-PULL**

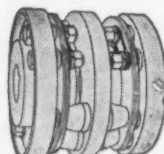
**NO LUBRICATION IS REQUIRED!**

The Thomas All-Metal Coupling  
does not depend on springs, gears,  
rubber or grids to drive. All power  
is transmitted by direct pull.

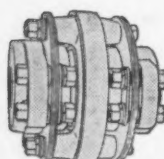


WRITE FOR COMPLETE  
ENGINEERING CATALOG

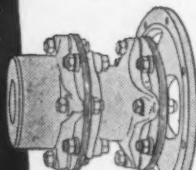
**THOMAS FLEXIBLE COUPLING CO.**  
WARREN, PENNSYLVANIA



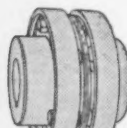
TYPE DBZ



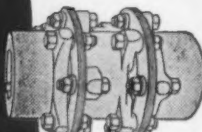
TYPE DSM



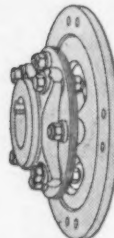
TYPE CM



TYPE ST



TYPE AM



TYPE SS

tions, grades, etc., of tin plate is contained in the "Steel Products Manual on Tin Mill Products" published by the American Iron and Steel Institute, 350 Fifth Ave., New York. Referring to your last mentioned problem, coke tin plate is hot dipped tin plate. A hot dipped coating is necessary for certain fruits, vegetables and other food products and for other products which tend to eat through the coating of the container. The electrolytic coating, however, is satisfactory for general line cans for nonreactive products, such as tobacco and for toys, decorative purposes, etc.—Ed.

### MALLEABLE CASTINGS

Sir:

... We have a problem in endeavoring to find open capacity for malleable iron castings and felt that you might be able to help us. There is only one malleable iron source in all the western states, and they are pretty well loaded. We have contacted any number of midwestern and eastern foundries only to be informed that they could handle no additional business. If you know of any source for malleable iron castings that would be interested in western business, we would appreciate getting the names of any such foundries from you.

R. L. GALBRAITH  
Director of Purchases

Pacific Div.  
Bendix Aviation Corp.  
North Hollywood, Calif.

### TIME STUDIES

Sir:

Please send 10 copies of your booklet "Techniques and Time Study-Incentives and Job Analysis" as mentioned on p. 57 of the Sept. 26, 1946, issue.

J. W. BARTON  
Cost Accounting Dept.  
Boeing Aircraft Co.  
Seattle

● Copies are available to readers at 60¢ each.—Ed.

### ALUMINUM SOLDER

Sir:

We are interested in the article, "Soldering Aluminum" appearing in the June 26 issue, and would appreciate the addresses of the makers of aluminum solder mentioned...

WASHINGTON ORNAMENTAL  
IRON WORKS

532 E. 31st St.  
Los Angeles

● L. S. Johnson Co., 2250 S. Indiana Ave., Chicago 16; Eutectic Welding Alloys Corp., 40 Worth St., New York; Alsoco Corp., 10 E. 52nd St., New York.—Ed.

### INSTRUMENT CASES

Sir:

I am in need of a small case for an electronic instrument that I am at present designing and am interested in finding out whether there is a list of stock fabricating dies for metal cases giving approximate dimensions and descriptive information. The case



# HALF-HOUR CLEANING JOB

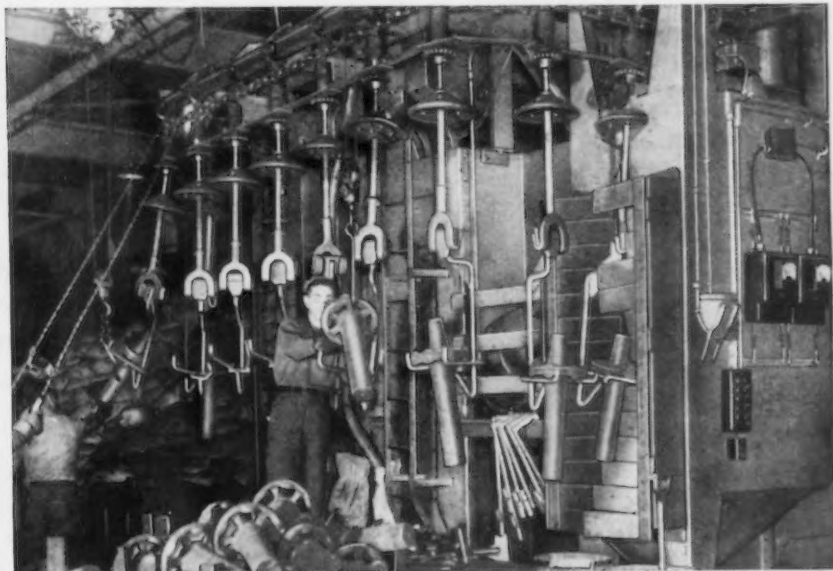
*Wheelabrated in 1½ MINUTES*

**THE PROBLEM**—Due to the excessive time required to clean forged aviation crankshafts, propellor shafts, etc., production schedules were difficult to maintain at Wyman-Gordon Company, Worcester, Mass. Special individual handling of the heavy, bulky pieces made the work slow and costly. The daily cleaning of more than 200 tons of smaller forgings presented an additional problem.

**THE SOLUTION**—The installation of a Wheelabrator Cabinet with heavy duty conveyor system for handling the larger pieces on a production line basis was made. Two airless Wheelabrator blast units are employed in the cabinet to provide complete abrasive coverage of all pieces and to permit the cleaning of the many different sizes of forgings produced.

Cleaning time for 550 pound crankshafts and other bulky, heavy pieces was reduced from 30 minutes to 1½ minutes. A steady procession of these large forgings passes through the machine at a continuous rate of one every minute and a half.

For cleaning smaller forgings, five Wheelabrator Tumblasts are utilized. The daily production of more than 200 tons of miscellaneous forgings is handled in these machines.



Cleaning forgings in a Wheelabrator Cabinet at Wyman-Gordon Co., Worcester, Mass.

## Partial List of Heat Treat & Forged Parts Cleaned by Wheelabrator

Bearings	Gears
Cutlery	Spines
Pinions	Rakes
Shovels	Hoes
Axles	Valves
Springs	Chains
Wheels	Sprockets
Tool bits	Drills
Wrenches	Pliers
Washers	Files
Saws	Chisels
Hammers	Dies
Reamers	Shafts

## Used by Leading Heat Treat & Forge Shops

S.K.F. Industries, Inc.  
Thompson Products Inc.  
Timken-Detroit Axle Co.  
Allis Chalmers Mfg. Co.  
Reed Roller Bit Co.  
Stanley Rule and Level Co.  
Remington Arms Co.  
Ford Motor Co.  
Cushman Chuck Co.  
General Electric Co.  
L. S. Starrett Co.  
Nash-Kelvinator Corp.  
Ex-Cell-O Corp.  
Caterpillar Tractor Co.  
Timken Roller Bearing Co.  
Kelsey Hayes Wheel Co.  
Ingersoll-Rand Co.  
Oliver Farm Equipment Co.  
Ross Gear & Tool Co.  
International Harvester Co.  
Billings & Spencer Co.  
Plomb Tool Co.  
Park Drop Forge Co.  
Simonds Saw & Steel Co.  
Union Fork & Hoe Co.



Write for latest booklet  
"CLEANING PROBLEMS SOLVED  
... In the Heat Treating  
and Forging Industry."



# American

WHEELABRATOR & EQUIPMENT CORPORATION

(Formerly American Foundry Equipment Co.,)

310 S. Byrkit St.

Mishawaka 3, Ind.

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT



*Plater's  
Supplies*

## Tested for Quality

### SOLD AT REGULAR MARKET PRICES

Udylite carries one of the largest stocks of plating and finishing supplies in the country—ready for immediate shipment—sold at regular market prices.

And, every item in the stock has been tested for quality in Udylite laboratories. Only materials which meet our rigid specifications are accepted in our warehouse.

Without paying any more for his supplies, the Udylite user obtains the benefit of expert, experienced laboratory control of quality. He is assured that what he buys at Udylite will be the best obtainable—exactly meeting specifications. This is a Udylite extra service well worth having.

2765

**Udylite**

**THE  
UDYLITE CORPORATION**  
DETROIT 11, MICHIGAN  
REPRESENTED IN PRINCIPAL CITIES

should be lightweight, preferably of aluminum and should have a hinged lid. The size should be approximately  $5\frac{1}{2} \times 3 \times 1\frac{1}{4}$  in. high.

I. COLLOFF

507 Eighth Ave.  
Asbury Park, N. J.

● We are forwarding a list of aluminum box manufacturers that may have a stock fabricating die to make the instrument case you require.—Ed.

### PICKLE POLISHED STAINLESS

Sir:

Will you please send a reprint of "Pickle Polished Stainless Steel." I believe it was in the Jan. 11, 1940 issue.

J. D. CLOKEY, JR.  
General Manager of Sales

Washington Steel Corp.  
Washington, Pa.

● We are forwarding a photostatic copy since reprints of the article are no longer available.—Ed.

### POWDER METALLURGY

Sir:

Will you kindly mail us two copies of the May 22 issue in which we understand there is an article on powder metallurgy by Earl S. Patch.

E. V. THOMPSON  
Secretary-Treasurer

Pyron Corp.  
Niagara Falls, N. Y.

● Copies of the article, "Powder Metallurgy—Process or Product?" in which you are interested are being sent to you.—Ed.

### INTERRUPTED QUENCH

Sir:

Will you please send me tear sheets of the article "Controlling Physical Properties by the Interrupted Quench" which appeared in the July 3 issue.

H. W. WHITNEY  
Metallurgical Engineer

Bliss & Laughlin, Inc.  
Harvey, Ill.

### STEEL STATISTICS

Sir:

We are making a statistical study of the steel industry at Golden Gate College. In the course of this activity we would like to have your advice as to where we can find the following statistics: Unfilled orders for the industry as a whole, 1927-41 by months, iron and steel scrap prices 1927-41 by months, pig iron prices 1927-41 and average price of finished steel for the industry for the same years. Whatever you can do to help us will be appreciated.

W. T. BENSON  
Instructor in Statistics

Golden Gate College  
San Francisco

● Price indexes compiled by THE IRON AGE covering your inquiry as to prices on iron and steel scrap, pig iron and finished steel are being forwarded. No information on unfilled orders for the industry is available. Steel production, except for the late defense and early war period, closely follows orders. Hence the steel ingot oper-



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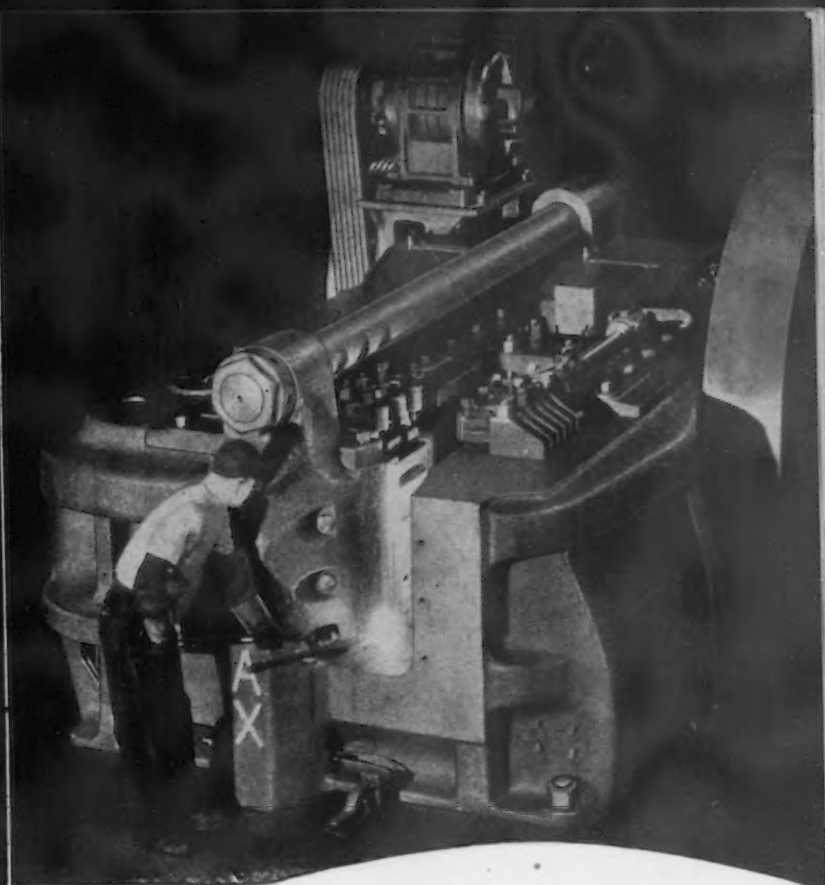
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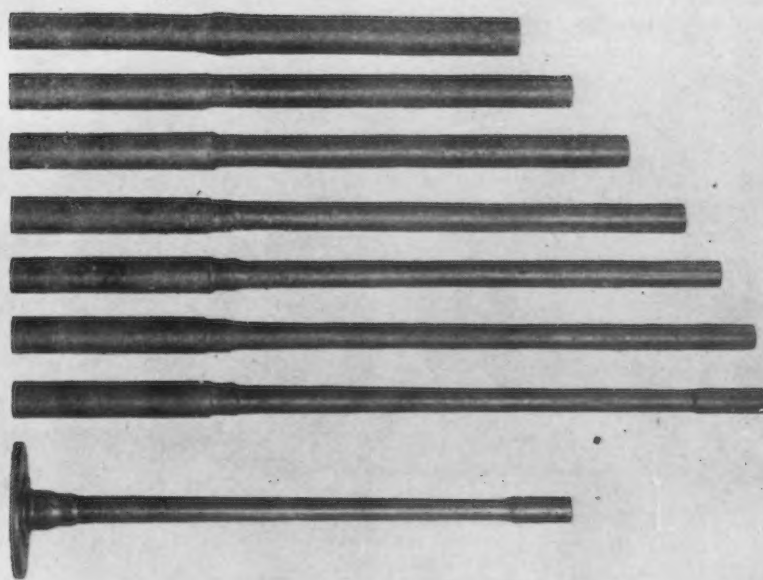
## AJAX FORGING ROLLS Super Rear Axle Shafts

## Ready for Flanging on AJAX FORGING MACHINES

AJAX Forging Rolls are used extensively and advantageously in the forging of tapered automobile and truck rear axle drive shafts. The rolls form the tapered section between wheel seat and spline—accurate, smooth and free from seams or flash lines which would start fatigue failures. After straightening, no machining is done on this tapered section.

When called for, the tapered wheel seat can be rolled at the same heat. When a flange is required, the end is re-reated and upset accurately and close to dimensions in an Ajax Forging Machine.

Write for Bulletin 91-A.



Steps in Rolling a 16 Pound Flanged Axle Shaft

# THE AJAX

MANUFACTURING COMPANY

EUCLID BRANCH P. O. CLEVELAND 17, OHIO

110 S. DEARBORN ST.

CHICAGO 3, ILLINOIS

DEWART BUILDING

NEW LONDON, CONN.

# Material Handling at First U. S. Tin Plant *built around BAKER TRUCKS*



The continuous operation of the Tin Processing Corporation's Texas City plant—largest tin smelter in the Western Hemisphere—built to meet our war requirements—depends on the durable and reliable service of a fleet of Baker Trucks.

Ore arrives by vessel in 100 lb. bags, which are palletized at the wharf and loaded by a Baker Fork Truck onto flat cars, for transportation to the plant. Here another truck unloads and stores the pallet type crates.

As ore is needed, a fork truck carries a crate to the mixing hopper, placing it on a raised deck, from which bags are emptied into the hopper. After crushing and purification, ores go to the smelter for reduction to metal and casting into bars. Stacks of bars weighing 4,000 lbs. are carried by truck to storage and later to box cars for shipment.



Besides Baker Fork Trucks, the plant uses a Baker Hopper Truck with built-in scale for measuring batches going to smelting furnaces.

Management and maintenance men are enthusiastic about the trucks—particularly because of their excellent service under the difficult operating conditions caused by the relatively fine and gritty nature of the ore handled.

Let a Baker Material Handling Engineer show you how to improve your production efficiency.



Members  
Electric Industrial  
Truck Association

**BAKER INDUSTRIAL TRUCK DIVISION**  
of The Baker-Raulang Co.

2175 West 25th Street • Cleveland 13, Ohio  
In Canada: Railway & Power Engineering Corp., Ltd.

## Baker INDUSTRIAL TRUCKS

ating rate, or ingot production is more generally taken as an index of activity. Under the Controlled Materials Plan during the latter part of the war, and currently, when steel producers are unable to book orders except for a limited advance period, an unfilled order index would have little value as an indication of steel demands. —Ed.

### STILL POPULAR

Sir:

In reference to a Newsfront item in your issue of Apr. 3, you described an inert paint that could withstand temperatures up to 2400°F. This paint could be used in heat treatments. Would it be possible for you to tell us where we can get further information on this item?

JEROME J. STERN

Whyte Mfg. Co., Inc.  
New York

● The coating was developed by Mr. Harry Sweeney of the National Copper Paint Corp., 1760 W. Diversey Parkway, Chicago 14.—Ed.

### REQUEST FROM PARIS

Sir:

We are interested in the article, "Precision Casting—Lost Wax Process" and we should be glad if you can send us two copies...

M. J. GORDON

L'Outillage R.B.V.  
Paris

● The booklet containing 12 articles on the subject is available at \$1 a copy.—Ed.

### PROPER CUTTING FLUID

Sir:

We are interested in the article, "Selecting the Proper Cutting Fluid," which appeared in the Feb. 20 issue and we would appreciate tear sheets.

A. R. READ  
Works Manager

Sternol Ltd.  
Mithell, England

### ELECTRIC SMELTING

Sir:

Would appreciate receiving tear sheets from the Dec. 3 and 10, 1942, issues, covering the article by Herman Cowes, "Smelting Iron Ores Electrically." If tear sheets are not available kindly advise cost of a photostat copy.

J. C. VIGNOS  
Vice President

Ohio Ferro-Alloys Corp.  
Canton, Ohio

● We have had photostats of the article made for you, since tear sheets are not available.—Ed.

### HARD-FACING MATERIALS

Sir:

Please send me tear sheets on "How to Select Hard-Facing Materials" which appears in the July 3 issue, p. 62.

K. G. PRESSER  
Chief Metallurgist

National Supply Co.  
Springfield, Ohio